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THE
PRACTICAL MEDICINE SERIES

COMPRISING TEN VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY

UNDER THE GENERAL EDITORIAL CHARGE OF

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VOLUME VII.

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PEDIATRICS.

DISEASES OF THE NEWBORN.

Congenital Sarcoma of the Femur. A case of congenital periosteosarcoma of the lower end of the femur is reported by C. Goebel.[1] The child was first seen by the writer when he was three weeks old. At birth the midwife noticed a swelling on the inner side of the right knee but thought it due to trauma, as the labor had been difficult. The tumor remained about the same size until the end of the second week, when it began to grow very rapidly. Examination at this time showed a somewhat atrophic child with a tumor reaching from the middle of the thigh to the middle of the leg. This appeared to be made up of nodules the size of an apple and gave pseudofluctuation. The skin over the tumor was shiny and covered with large veins.

As exarticulation of the leg was forbidden by the parents, the tumor was removed and the area subjected to *x*-ray exposures which were begun the second day after operation. Recovery was complete and at last report there was no sign of recurrence.

Microscopic examination of the tumor showed it to be a pure spindle-celled sarcoma.

Hemorrhagic Diseases of the Newborn. Among newborn babies, according to H. E. Tuley,[2] hemorrhages are likely to occur and, because the true pathology of the condition is so slightly understood, the symptom-complex is now called in general terms, "Hemorrhages of the newborn." The etiology of the condition is obscure; but, as fever is usually marked, the most frequent causative factor is thought to be a general septic infection. Lambert, in

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(1) Archiv. f. Klin. Chir., Sept. 12, 1908, B. 87, H. 1.
(2) Jour. Am. Med. Assoc., Dec. 26, 1908.

the report of his most interesting case, asserts that the following bacteria have been isolated: Staphylococcus, Pneumococcus, *Bacillus pyocyaneus, Bacillus coli, Bacillus typhosus and Bacillus diphtheriæ.*

Among the other causative factors have been mentioned prematurity; atelectasis; deformity of the heart; persistent foramen ovale or ductus arteriosus; ulcer of the stomach and intestine (this due to a venous stasis and followed by a thrombosis); fatty degeneration of the arterioles; extreme delicacy of the blood vessels; congenital obstruction of the portal venous system; congestion from pulmonary, cardiac or hepatic disease; excessive secretion of gastric juice resulting in partial digestion of the mucosa of the stomach and intestine, congenital hemophilia; and the great changes in the circulation incident to birth.

These hemorrhages may come from any organ and may occur before birth or subsequently. When postnatal, they usually take place within the first three days after birth.

The prognosis varies according to the site of the bleeding. Different authors make different estimates of the mortality; in Townsend's cases 62 per cent., and in another series of 709 cases 79 per cent., in Williams' 60 per cent. Holt believes no observer has seen more than one-third of his patients recover.

The following history is given as illustrative of that form of hemorrhage known as melena.

The patient was a normal baby, born after a comparatively easy labor. On the third day the child vomited red blood enough to stain the clothes through and through. Shortly after this a very large movement of meconium was passed containing red blood, very easily distinguished in the black meconium mass.

The child was pale and blue around the nose, showed a weak and rapid pulse and refused to nurse after vomiting blood. Attempts at nursing were discontinued after the hemorrhage. For two days vomiting of blood and hemorrhage from the bowels continued, the latter profuse and passed in clots.

After being treated with subcutaneous injections of gelatin solution, 2 per cent., the child made a good recovery and at the end of the second week had regained the birth weight and began to thrive.

Different methods of treatment have been suggested by various authors: Koplik, the cold coil, ergotin, ½ to ¾ grain subcutaneously; Henoch, 1 gtt. of liquor ferri sesquichloridi in barley water, every hour; Williams, gallic acid, gr. i, every 3 hours, oil of turpentine, m. i, in muscilage every hour, extract of krameria, gr. ii, every 2 or 3 hours, or an injection into the bowel of an infusion of 4 to 5 oz., of calcium chlorid to increase the coagulability of the blood.

The subcutaneous injection of gelatin employed in the case reported was followed by prompt recovery. The English gelatin was used as the ordinary commercial article has been found contaminated with the tetanus bacillus. Two sterilizations of the gelatin were made to destroy this organism utterly. An ordinary antitoxin syringe or aspirator, without too large a needle, was employed for the injection. The cellular tissue of the back was selected and the solution warmed and 20 c.c. slowly injected.

Melena Neonatorum. A Mettler[1] reports a case of melena neonatorum with severe intestinal hemorrhages, which ceased entirely after an injection of 10 c.c. of a 10 per cent. sterilized gelatin solution.

Hemorrhage into the Adrenals in Infants. J. C. Litzenberg and S. M. White[2] report two cases of hemorrhage into the adrenals in newborn infants. The first baby was normal in every way until forty-eight hours old, when he refused to nurse, was very fretful, and cried most of the time. Temperature was 106.8° F.; there were repeated convulsions and a black, melanotic material passed from the bowel; on the third day the same kind of material was vomited, gas frequently passed and dark blood was continually passed and vomited. On the sixth day the hemorrhages from the mouth and bowels were much worse and of a very disagreeable odor. The baby was evidently suffering from infection and showed signs of bronchopneumonia. On the sixth day he suddenly collapsed and died.

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(1) Correspondenz Blatt f. Schweizer Aertze, 1908.
(2) Jour. Am. Med. Assoc., Dec. 5, 1908.

Autopsy showed: (1) General infection with *Bacterium pneumoniæ* (Friedlander); (2) focal necrosis with extensive parenchymatous hemorrhage into both adrenals; (3) focal pneumonia, with focal hemorrhagic infiltration of lungs; (4) hemorrhage and edema of intestinal mucosa and submucosa, with melena.

The second baby had been slightly asphyxiated at birth but was quickly resuscitated. The passages from the bowels were offensive on the first day. The baby lost 1½ lb. the first two days and the ejections remained offensive. There was no hemorrhage from the bowels. On the third day the breathing was very rapid and the temperature 104° F. On the evening of the fourth day the baby's skin suddenly blanched, the child collapsed and died as if from internal hemorrhage.

Autopsy showed: (1) General infection with *Bacterium pneumoniæ* (Friedlander); (2) partial atelectasis of lungs, with small foci of hemorrhage and catarrhal bronchitis; (3) focal necrosis of adrenal glands, with congestion and small hemorrhagic foci in left, with extensive hemorrhage in right, ruptured capsule and infiltration of right perirenal fatty capsule, ascending and transverse mesocolon, and inferior surface of diaphragm.

Discussing adrenal hemorrhage in the newly born, the writers say: 1. "Hemorrhage of the suprarenal capsules is more common than hemorrhage in the other viscera. 2. This is due primarily to the close relation of the adrenals to the vena cava which makes congestion easy, and to the peculiar anatomic construction which favors hemorrhage. 3. A weakness of the vessel walls, either normal delicacy or pathologic alteration, favors the rupture. 4. The place of election of the hemorrhage is usually the internal cortical zone because of its vascularity and the anastomotic arrangement of the vessel. 5. The bleeding always follows active or passive congestion. 6. Passive congestion may be caused by difficult labors, obstetric operations, thrombosis; in short, anything that favors venous stasis. 7. Active congestion is induced by infection or any toxemia which incites hyperemia by a superactivity of the glands. 8. The discovery of the pneumobacillus of Friedlander in the two cases reported and other bacteria in five additional cases proves beyond question that infection is a cause of adrenal hemorrhage. 9. Death results either from loss of blood or an interference with the physiologic function of the gland.

Hematoma of the Sternocleidomastoid Muscle. J. Comby[1] reports four cases of hematoma of the sternocleidomastoid muscle. The children were one, six and ten months old and one four years, and in each case there was a history of severe labor. Only in the last child, in whom the affection had lasted a number of years, was there a torticollis; in the others massage and inunction of potassium iodid ointment caused the tumors to completely disappear. The tumor is the result of a hemorrhage due to the tearing of the muscle fibers. It usually occurs in breach presentations with difficult delivery of the head.

The differential diagnosis between this and congenital torticollis is of practical value.

A Case of Ascites in the Newborn. A case of ascites in the newly born is reported by H. M. Inglis.[2] Labor was normal, but there was a slight difficulty in delivering the body of the child. On examination the child's abdomen was found greatly distended and so tense that the abdominal organs could not be palpated. About twelve hours after birth the child passed a large quantity of urine and the abdominal tension became much less pronounced. Death occurred thirty-six hours after birth. Postmortem examination revealed a considerable quantity of bile-stained fluid in the peritoneal cavity. The intestines seemed to be covered with blisters, the largest as big as a walnut. All the organs apparently were normal.

A Case of Edema Persisting Since Birth. A case of edema persisting since birth is reported by G. A. Sutherland.[3] L. J., female, aged seven months, has been the subject of edema of the feet since birth. In ordinary circumstances there is to be observed on each foot marked swelling of the dorsum, the sole and the toes. The edema ends abruptly at the ankle, which is freely movable. The dorsal swelling is rather pale and pits on pressure. The sole is tense and swollen, shows no pitting, and is pinkish-red.

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(1) Archiv de Med. des Enfants, January, 1908.
(2) The Lancet, July 18, 1908.
(3) British Jour. Children's Dis., July, 1909.

This color disappears entirely on pressure. The toes are also pinkish-red, tense, and the nails are partially covered by the swelling around them. When the feet are cold, they rapidly become blue or blue-black. When the child is ill in any way, the swelling of the feet grows more pronounced.

Physical examination detects no cause for the edema. The infant has suffered from gastrointestinal disturbance, accompanied by lichen urticatus, of which the striking feature was the appearance on the head of large urticarial wheals. These were as large as hazel-nuts, very tense and white. This happened when the baby was three months old and typical eruptions of lichen urticatus have appeared about the body and extremities at intervals since.

The nature of this form of edema is obscure. Possibly the association with lichen urticatus lends probability to the idea that it is due to a general vasomotor disturbance, intermittent in its action except in the circulation in the feet where it is constant.

[The Editor has recently treated an interesting case of edema in a child two years old. The edema came on suddenly and was preceded by a slight intestinal disturbance. The hands, feet and genitals were markedly swollen; the child acted stupid. The only other finding was a very irregular heart. The urine and blood were negative; blood pressure was 90. Improvement rapidly followed a thorough cleaning out of the intestinal tract and the use of atropin sulphate gr. 1/1000 and citrate of caffein gr. $\frac{1}{4}$ four times a day to support the heart.]

Intracranial Hemorrhage in the Newborn. James R. Torbert[1] presents two cases, with postmortem findings, of intracranial hemorrhage in the newborn, with a brief review of the literature. He emphasizes the need of watching the infant closely during the first few days, and also the need of performing a postmortem in those cases of early death where the cause is at all doubtful. On account of the comparative freedom from danger in performing a craniotomy on the newborn child, he believes, with Cushing, that an operation may prevent both immediate death and the later serious consequences.

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(1) Boston Med. and Surg. Jour., April 22, 1909.

HYGIENE.

Anatomic or Physiologic Age Versus Chronologic Age. C. W. Crampton[1] says that the anatomic or physiologic age should be taken as a basis for all records, investigations and pedagogic, social or medical treatment of children. The term anatomic or physiologic age refers to the stage of development in distinction to the usual estimate, chronologic age.

Individuals of the same species so vary in their rate of development, that a group of one chronologic age contains some developed far beyond the average and others retarded considerably below the average. It is easy to distinguish between a complete absence of pubic hair and an abundance of the same and to designate the individuals as prepubescent or immature, or, on the other hand, as postpubescent or mature, but the process of acquiring this growth is slow and to place an individual with but a beginning growth is difficult. To eliminate this uncertainty there may be established an intermediate class, the pubescent or maturing. This class contains all who have anything more than an abundant lanugo and less than a very well defined covering.

Table No. 1 gives the half-year groups in a New York public school, with reference to physiologic age, and demonstrates the important fact that the chronologic age groups are not homogeneous.

TABLE NO. 1.

Age in years.	Physiologic age groups. Immature. Per cent.	 Maturing. Per cent.	 Mature. Per cent.
12.5—13.0	69	25	6
13.0—13.5	55	26	18
13.5—14.0	41	28	31
14.0—14.5	26	28	46
14.5—15.0	16	24	60
15.0—15.5	9	20	70
15.5—16.0	5	10	85
16.0—16.5	2	4	93
16.5—17.0	1	4	95
17.0—17.5	0	2	98
17.5—18.0	0	0	100

If the immature differed from the mature in no other

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(1) Pediatrics, June, 1908.

way it would hardly be worth while to separate the groups. They do, however, differ radically and show a striking physical change in the progress from immaturity to maturity. At characteristic ages the mature are more than 33 per cent. heavier, 10 per cent. taller and 33 per cent. stronger than the immature. In view of these great physical differences, it is not at all surprising that there are demonstrable differences in mental abilities. Since the medical adviser of the family is almost invariably concerned in matters relating to the school, it seems especially fit that he should at least outline the vast influence of physiologic age upon education. Our educational plan fails to take any cognizance of the difference between the immature and the mature and of the vast development of the old abilities and the accession of new traits during pubescence. The deficient scholar is retained in school long after he has reached maturity, and in the lower grammar grades in New York city are thousands of mature children, poor scholars, more out of sympathy with school work than ever before, resistant to all school authority, turbulent, unruly, wasteful and useless, merely cumbering the scholastic ground until they become successful truants, or finally by hook or crook succeed in getting their "working papers." Yet this class of boy is by no means inferior in other than scholastic lines.

The fundamental fact is wholly disregarded. A child when he matures commences to feel his newly acquired neuro-muscular ability, his increased mental grasp and his change of attitude toward life, and consciously essays to fit himself into the scheme of adult affairs and to prepare his way for a livelihood and a competence.

In the light of the foregoing facts it is recommended that children who mature in the lower grades be given the opportunity to learn something in the elementary school which will directly prepare them for taking a part in active life. Trade education, office management, working with machines, typewriting and stenography, in short, industrial education should be introduced for the purpose of training them for useful citizenship.

Where mature and immature children are now brought together in the elementary or high school, they should be

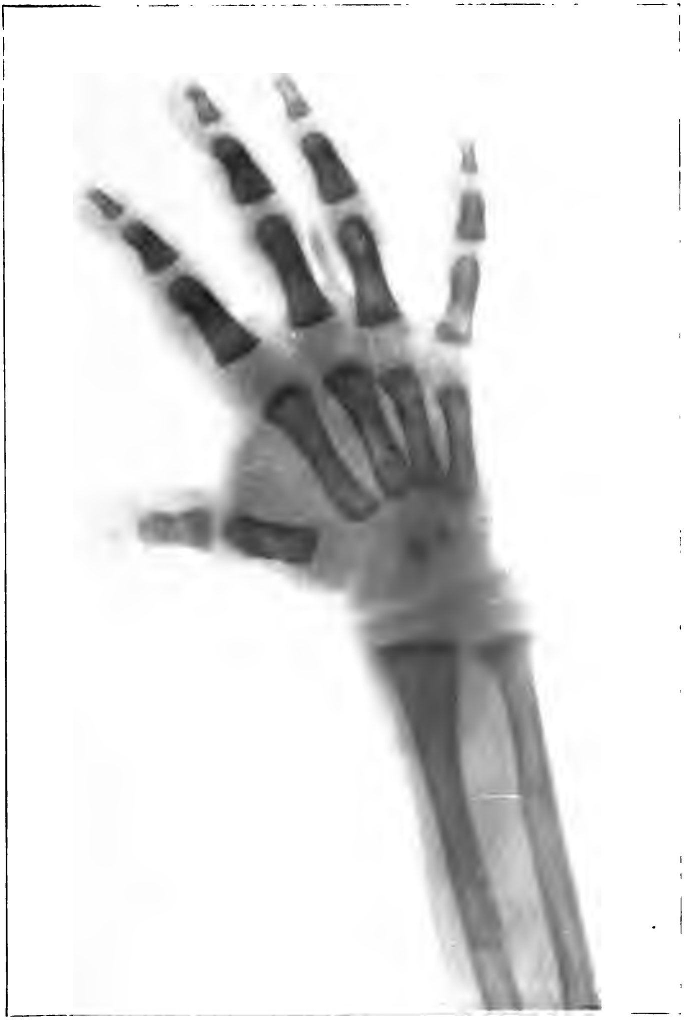

PLATE I.

Hand representing Group A, which shows the cartilaginous wrist with no epiphysis and with only two bones. Reproduction is about actual size. T. M. Rotch. (Page 17.)

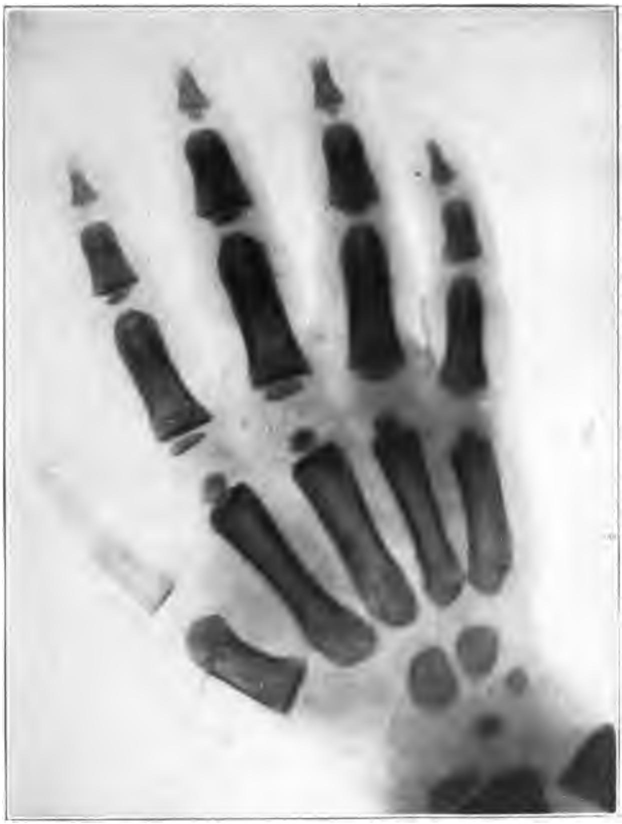

PLATE II.

Hand representing Group D; shows four bones. Reproduction about actual size. (Page 17.)

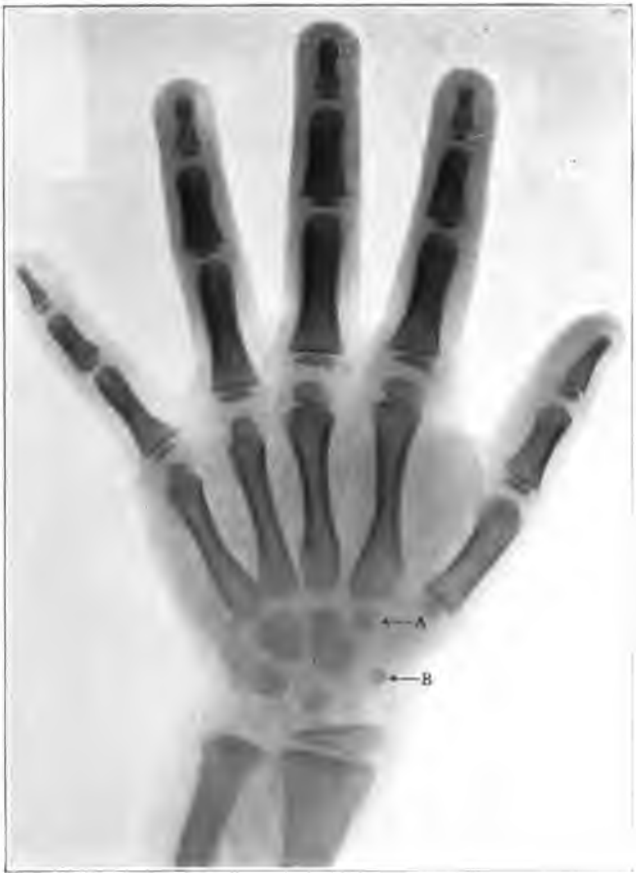

PLATE III.

Hand representing Group E; shows an additional bone, this time probably the trapezium, the six bones, in addition to the epiphysis of the radius, marking the development which has been described as belonging to Group F. The reproduction is about five-sixths actual size. (Page 17.)

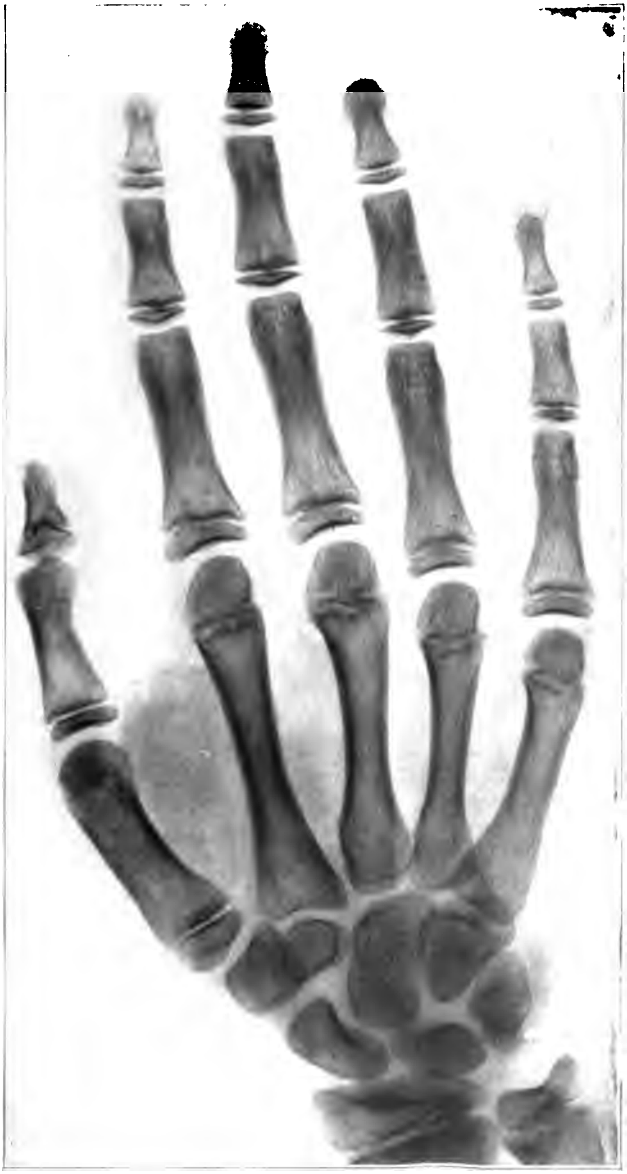

PLATE IV.

Hand representing Group L; shows all the bones very much more advanced in development than in Groups J and K and also the pisiform bone now appears very plainly just under the end of the cuneiform bone. Reproduction about actual size. (Page 17.)

separated into different classes in order that the pedagogic, ethic and social treatment to which they are subjected may be better adapted to their separate and distinct requirements and abilities.

Child labor legislation should be based upon physiologic age. It is agreed that no child physically defective or ill should be allowed to engage in any but the lightest tasks.

All observations, records and investigations of children and all treatment, whether pedagogic or medical, social or ethic, must regard physiologic age as a fundamental basis.

Chronologic and Anatomic Age in Early Life. T. M. Rotch[1] has made an extended study as to the best method of determining the normal anatomic development from birth to 14 years. He believes that in the future age will be determined by anatomic conditions rather than by chronologic periods, whether for gymnastics, athletic sports, kindergarten, school or child labor.

It is important that such anatomic standards should be readily obtainable and should be determined in the living child with the least degree of complexity and in the most simple form possible. In the study of about 500 healthy children at the Children's Hospital by means of the Roentgen method, Dr. A. W. George found that the most practical and reliable index of development was represented by the hand and wrist. It therefore occurred to the writer that a careful study of the normal and anatomic conditions present in the bones of the hand and wrist during different stages of their development would best aid in classifying the different periods of child life, and having formulated such a classification it could then be practically applied to physical and educational problems.

He therefore made up alphabetic groups (A, B, C, D, etc.). In making up these groups it is arbitrarily assumed that the carpal bones and the lower epiphyses of the radius and ulna, according as they develop early or late, are represented by the alphabetic divisions. Also assuming that none of these bones are normally present at birth and that the os magnum and the unciform appear in the first year, this group of cases is placed under A. Under B is grouped those hands which show the presence of the lower epiphy-

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(1) Jour. Am. Med. Assoc., Oct. 10, 1908.

sis of the radius in addition to the bones present in group A; under C, those which show the presence of the cuneiform bone in addition to those in common with A and B. The heads of the metacarpal bones and the epiphyses of the first phalanges at this period can be used as controls of this Group C. Still under these arbitrary divisions are placed groups which successively show the presence of the semilunar and the trapezium, with the second and fourth terminal phalanges as controls of this group, and there are then introduced as additional groups those which show the scaphoid, the trapezoid, the lower epiphysis of the ulna and the pisiform bone.

Rotch has prepared pictures, choosing each as representative of its especial group. If this system of grading children proves to be correct and useful, it is very evident that, except legally, we should no longer think in years and months, but in normal anatomic classes, A, B, C, D, and so forth. See plates I, II, III and IV.

In bringing before the medical profession this idea of using the Roentgen method for physical and mental classification, the writer wishes it to be understood that he is merely asking the profession to endorse and educators to make trials of what seems, by a very careful study of the conditions connected with this subject, a probable means of doing justice to young human beings and of living up to our adult responsibility toward an otherwise unprotected period of life.

Instruction in the Care of Babies, to Mothers and Older Girls. C. Herrman[1] expounds the method of instruction in the care of babies as given to mothers and older girls by the New York Board of Health. Six physicians are appointed to lecture on the care of babies to mothers and older girls in the vacation play grounds for mothers and babies, which grounds have been established at a number of public schools. These play grounds are open during July and August and are situated in the tenement house part of the city. From the outset it was apparent that as much could be accomplished by instructing the older girls as the mothers, if not more. In many cases the "little mothers" are compelled to care for the baby the greater part of the day. Many of the mothers cannot understand English, but the girls all understand the language, are intelligent and quick to comprehend. They not only learn themselves, but can teach their mothers and others as well. They have plenty of opportunity to see the mistakes generally made and to correct them. It would be well if such instruction to girls were continued during the regular school term, so that all would profit and not only those who visit the play grounds.

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[1] Pediatrics, Oct. 10, 1908.

In the "talks" to mothers and older girls simplicity, brevity and clearness are sought. Only the most important points are discussed, but these are repeated and emphasized and all unnecessary details are omitted, while the language is the simplest, free from all technical terms. Brief explanations of the reasons for doing or not doing are given and illustrations likely to appeal to commonsense. The talk does not last more than 20 minutes. The audience is encouraged to ask any questions, no matter how simple. Many of the points considered are demonstrated by a nurse to the greater interest and value of the work. All the apparatus used is simple and inexpensive like what may be bought by the class of people instructed.

The Modern Babies' Dispensary. Gerstenberger,[1] in describing the modern babies' dispensary, says that an ideal institution ought to comprise the following parts:

1. A dispensary, both for sociologic and medical work, where mothers could bring their healthy babies soon after birth and their sick ones as well; where the visiting nurse could get instructions from the physicians and make records of her work; where girls, maids, students, nurses and physicians could acquire necessary training; the dispensary itself ought to have an office where records could be kept; where the superintendent could decide upon the worthiness of applicants; and where, by coöperation with various institutions, many problems could be solved, like finding mothers for babies and homes for both. There are necessary, besides, a waiting room, a weighing room, a number of examining rooms, one arranged for minor surgery and about three isolation rooms; advisable, too, would be a large lecture room and a clinical laboratory.

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(1) **Archiv f. Pediatrics, August, 1908.**

2. A milk laboratory, where clean milk is bottled; where, if the mother cannot, for some valid reason, modify the food at home, it may be modified and divided; and where the food can be pasteurized or sterilized if necessary.

3. For babies too ill to be cared for in the dispensary or home, a hospital equipped with chemical, clinical and pathologic laboratories, where nurses, nursery maids, physicians and students can be trained and where the questions constantly arising in their field can be worked out.

4. An isolation house for contagious diseases.

5. In the crowded outlying districts smaller branch dispensaries to which milk could be sent by the central institution and which would send their sick children to the central hospital.

6. Convalescent homes and fresh-air camps in the country or suburbs, especially during the summer.

The institution with which the author is connected consists of a dispensary, a milk laboratory and an emergency hospital room. Here four visiting nurses, who give their entire time, and six physicians, interested in both the medical and social side, serve. The dispensary comprises a clerk's room, a small bath room and a simple clinical laboratory.

The patient first enters the clerk's room, where his name is recorded on the index card and he is given an admittance card inscribed in his own language. If he shows a symptom which the clerk suspects is characteristic of a contagious disease, he is hurried off to a small room used for isolation. If there is no contagion, he passes into the waiting room, is weighed and his temperature taken by the nurse in charge. Then he passes into the examining room, where the physician first takes an accurate history, especially as to the quality and quantity of feeding since birth, examines him and notes the findings on his chart. The physician then personally advises the mother both as to medical treatment and manner of life, although the second subject is dealt with more fully at the second visit, before which the nurse usually has investigated the home conditions. As it takes much time to tell any mother, especially those of foreign tongue, how to nurse or feed their children there has been devised a diet slip upon which can plainly be designated how much, for how long and when the child is to be fed or nursed, and how the food should be prepared.

Before the mother leaves the examining room, she receives, in an envelope, an educational booklet printed in one of the five languages, outlining the subject of feeding and giving useful suggestions upon nursing, feeding and the care of children suffering from gastrointestinal diseases. On the last page is a weight chart, upon which, at each visit, the weight is entered. This is done to keep the parents interested and to force them to keep the booklet longer than they otherwise might in the hope that it will be read oftener.

The day after the first visit the nurse calls at the house, first to determine the financial standing of the family and their worthiness; then she shows how the physician's instructions should be carried out and makes suggestions not only in regard to the child but also to the entire home.

The age of applicants to be treated is limited to three years. During the first twelve or fifteen months it is expected that the baby be brought regularly once every two weeks when well and as often as necessary when ill. When he is well and on the regular diet for the second year, he is discharged and asked to return at the age of two years to be examined again, to give the physicians an opportunity both to see their results and to direct the feeding for the third year.

The Injurious Habits and Practices of Childhood; Their Detection and Correction. K. H. Goldstone[1] discusses the injurious habits and practices of childhood under the following heads:

Masturbation.—The writer is firmly convinced that a large number of phenomena designated under the general term "nervousness" in early life have their seat in the evolution of the psychic, physical and reflex explosions produced in the act of masturbation and that the general practitioner is rarely alert to its existence.

Predisposing causes are those which underlie most of the habits of childhood: (1) Malnutrition, overfeeding, and the abominable practice of giving whiskey and beer even to infants; (2) a highly neurotic constitution attributable always to heredity; (3) mental and moral delinquency in the child, the result of vicious habits and traits in the parents. As exciting causes are adherent prepuce in both sexes, gonorrheal vaginitis, eczema of the pudendum, and the presence in the rectum of the *Oxyuris vermicularis.*

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(1) Medical Record, June 20, 1908.

Infants and young children accomplish the act of masturbation in the majority of cases by thigh friction and by assuming postures in which the genitals come into contact with some object, usually a chair, the edge of the bed or a pillow.

Local signs in the female are hypertrophy of the clitoris and vaginitis; in the male balanitis and eversion of the lips of the meatus urinarius.

Masturbation is always a most difficult habit to break, especially in older children. In infants a great deal can be done to mitigate the habit and eventually to cure it. The restraint that is needed is of two kinds, physical and moral. With children under three years the contrivance that is most successful consists of side splints attached with adhesive plasters to the thigh, the outer splint reaching from above the trochanter to below the knee, the inner from half-way down the thigh to below the knee. Other physical methods are—tying the legs to the side of the crib and also tying the hands. Moral persuasion works well in young children. But in older ones more stringent methods are needed. The child's companions and surroundings should be looked into and his confidence obtained. Older children who masturbate should be sent from home if possible, given the benefit of good hygiene, fresh air and freedom from books and studies, and treatment should be directed toward the general health. Local causes must be looked into and corrected; these are circumcision in boys and forcible separation of adherent prepuce or nymphæ in girls. Mild counterirritation to the clitoris is beneficial, as are also cold ablutions to the spine.

Habit Spasm.—These spasms are at first always voluntary and under the full control of the will; but by persistence they become firmly fixed and are then not in the category of habits and may be designated as pure neuroses like athetosis, which is uninfluenced by treatment. Habit spasm is very frequently the result of mimicry and manifests itself by facial grimaces, blinking, frowning, shrugging of the shoulders, and is often accompanied by a coarse tremor of the hands. The spasm never affects the lower extremities. The diaphragm in the cases that have gone on for a long time is thrown into spasm, as evidenced by a dry, hard cough, gasping, sudden, long-drawn inspirations and hiccough. While at first these movements are infrequent, later they become almost continuous.

Almost the same rules of treatment apply to habit spasm as to masturbation. Early correction, mild and gentle admonition and attention to the general health. These children should receive the benefit of fresh air, country life if possible, and above all should be taken away from school.

Sucking.—Lindner divides sucking into simple sucking and sucking with combinations. In the former the child makes use of some part of the body, as the thumb, fingers, toes, lips, or a blanket or part of the clothing, and most frequently the "pacifier," which later will be considered. In sucking with combinations the sucking is accompanied by masturbation, or rubbing the ears or anus, which affords a pleasurable sensation. Sometimes sucking is accompanied by acts which produce pain, as pulling the hair and scratching the skin. Sucking begins in infancy and if not corrected early may go on to puberty, and infants who persist in the habit of sucking always become masturbators. Sucking, like other habits, becomes fixed and is then almost impossible to control. Besides the nervous factors, the sequelæ of sucking are deformities of the fingers, lips and teeth and curvature of the spine. These deformities may be serious. The advice given in the case of the other habits is equally applicable to sucking—early restraint, gentle admonition, and hygiene.

Pica (the eating of unwholesome and repulsive substances).—In the degree of danger to life and health that they entail, none of the habits approximate dirt-eating; for this execrable habit may give rise to grave nutritional disorders and even cause death. Ignorance, lack of proper training and supervision, bad hygiene, lack of sunshine and improper and badly prepared food are among the causes, backed by heredity. Change of surroundings with a good nurse and proper dietary measures are of the greatest importance in the treatment.

Nail-biting is a habit which is less pernicious and not so common as the others, but should be corrected early for the manifest reason of its conducing to other habits. The child's finger nails should be kept short.

Head-banging is a habit seen in children between the ages of two and six, characterized by violent banging of the head against a pillow or other object, lasting for a few seconds, and alternating with swaying of the head and head rolling. It is akin to habit spasm. In some instances it seems to be the effort of the child to relieve the pain of earache or neuralgia.

Disorders of Sleep.—Pavor Nocturnus. According to the classification of J. A. Coutts, night terrors may be divided into two main types,—(1) true night terrors, due to the disturbances of the central nervous system; (2) nightmare or disturbance of sleep, the result of bad practices. The causes of pseudoinsomnia are bad habits, such as rocking the child during sleep, night feeding and the consequent indigestion and colic. Lack of fresh air in the sleeping chamber and the presence of adenoid vegetations in the pharynx are among potent inciters. Again, infants much pampered and taken up as soon as they cry, become poor sleepers.

Proper training is most important. The infant should under no circumstances be rocked. Cradles are as distressing to a child as a small boat in an open sea to an adult. Regulation of meals and attention to the stools are not to be ignored. Among older children exciting stories should be avoided and reading and studying at night interdicted. Girls evincing signs of the approach of the menses should be kept from school until three months after puberty has been established; and last but very important, children should be put to bed at a definite hour.

The Pacifier.—The sucking of the pacifier produces in infants (1) the formation of adenoids by causing a congestion of the postpharyngeal wall and consequent hypertrophy of the lymphoid tissue situated between the two

Eustachian tubes and known as the pharyngeal tonsil; if adenoids are already present, they increase in size and extent for the same reasons; (2) deformities of the mouth and palate; (3) colic and flatulence by the sucking of dirty particles that always collect on the pacifier; (4) hypertrophied tonsils, due to congestion as mentioned in adenoids.

Public School Education. C. G. Kerley[1] discusses public school education in America from the point of view of physical and mental development. He opens with a citation from the last annual report of Superintendent Maxwell of the schools of New York city:

"Sitting several hours a day at a desk, possibly not hygienically constructed, increases such diseases as curvature of the spine and often produces faults of posture which the physical exercises of the class-room and the gymnasium barely avail to counteract. Defects of eyesight are certainly aggravated by work of the class-room."

The superintendent's suggestion that a department of hygiene be organized to coöperate with the Board of Education, is most timely. Such a board should be composed of a skilled oculist, an orthopedist, a laryngologist, a pediatrist and a sanitarian, with prerogative to arrange suitable type and printing for the different ages, to consider problems of ventilation and lighting, of posture, of vision, of the nose and throat, of nutrition and growth and of general hygiene, and to direct the recreation periods. A standard of control—a health clearing-house—should be established to determine the normal requirements for the various ages.

The writer also suggests certain changes in the curriculum. He would have the boy and girl who are to go out into life in the fourteenth or fifteenth year taught reading and penmanship, geography, history and arithmetic and given industrial and trade instruction.

Social prophylaxis is an important factor in the boy's education. It is the duty of the medical profession, who can appreciate the necessity of such instruction, to insist that it be carried on through the proper channels, the

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(1) Archives of Pediatrics, July, 1908.

schools, by methods determined by those expert in training the young.

One of the great scourges of the earth is intemperance in the use of alcohol. This is a practice which causes directly or indirectly more crime, poverty, diseases and untimely death than any other one factor, and yet it is barely considered in our public institutions of learning, although the law demands that such instruction be given. It is the child's right and for his own interest and his protection to know the effects of alcohol, immediate and remote, as well as the multiplication table.

By suggestion and encouragement, if not by direct advice, the young of our schools are constantly stimulated to strain for greatness. Emulation is in the school air. Every boy in some way is made to believe that in him is the metal from which presidents of the United States are cast; that out of such material are the great financiers, lawyers, physicians and teachers moulded; that he ought to be great and, if he gets his lessons by some means or other he is taking the first step toward that end. Training a child in an atmosphere so charged inevitably causes much disappointment, suicide and failure, since it is impossible to build a $10,000 or $20,000 a year intellect in a brain that can earn only $2 a day. This spirit, with the encouragement to higher education which comes from all sources—endowments, scholarships and rich men's colleges—induces youths to spend years in striving, to end only in failure more or less complete. This over-education of the unfit evokes unsuitable tastes, habits and desires and is the cause of more thieving, gambling and dishonesty than can well be appreciated.

Among the boys whom the writer has known intimately during the past twenty years, sons of carpenters, shoemakers, plumbers, brick-layers, not one wished to follow his father's occupation, but all would be lawyers, bank presidents, physicians. Not bank presidents, but poorly paid bookkeepers they are today, and all the professions are overcrowded with the disappointed unfit.

The writer would drive home the thought that "labor is the inevitable lot of the majority and that the best education is that which makes labor the most productive." For the boy who is to go out and become a member of the working-class, as millions must, somewhere in the curriculum, between the Spanish history period and the elocution period, a few minutes should be devoted to the dignity of honest toil and the disgrace of work badly done. Such a boy should be taught reading, writing, arithmetic and the rudiments of a trade. Somewhere between the zoölogy and the commercial law period the girl who is to bring up a family of children and will have to do her own housework, should get more than a passing glance at physiology, cooking, sewing and food values.

Fatigue in School Children. R. G. Freeman[1] tried various tests for fatigue on a number of children in the New York public schools and summarizes his conclusions. The Crampton test applied to school children in New York gave negative results; the Storey ergograph also gave negative results and is unsuitable on account of the use of accessory muscles, when the abductor indicis becomes fatigued; the Mosso ergograph, combined with an adder, as used in the Chicago public schools, is the more reliable instrument, but failed to give evidence of marked fatigue of the pupils during the school day in a private and also in a public school of New York city. Of course, occasionally any form of ergograph will give evidence of fatigue. The ergograph, so far as the writer's work indicates, is of no value in modifying the day in the public schools of New York for the average student, but might be of value in lightening and controlling the work for those pupils who give evidence of marked fatigue during the school day.

The Dangers and Evil Effects of Infant Binders. A. Waring[2] deprecates the use of abdominal binders for infants. In the first place, the discomfort even when the binders are not very tightly fixed, may cause restlessness, crying and loss of sleep, which, if long continued, will affect the health of the child. When the constricting effect of binders is at all severe, the infant presents outward typical signs which may at once be recognized. The facial expression, livid hue, dilated temporal veins, especially

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(1) Am. Jour. of the Med. Sciences, November, 1908.
(2) British Med. Journal, June 13, 1908.

noticeable when the child cries, restlessness, clenched fists, readily give the clue.

Vomiting frequently results from undue constriction, especially when both thorax and abdomen have been covered with one wide abdominal binder or two separate ones.

Inguinal hernia is likely to result from an increase in both the intraabdominal and intrathoracic pressures from the tight application of either one wide binder, such as the abdominal or thoracic, or two or more separate binders enclosing both abdomen and thorax, the whole pressure of the abdominal contents being thus thrown on the inguinal region.

Distension of the hemorrhoidal veins and even prolapsus ani may result from long-continued binding.

The thoracic binder or swathe, when applied tightly, firmly and continuously, may decidedly arrest the growth and development of the infant.

In cases of severe constriction the cerebral circulation may be so disturbed as to cause convulsive seizures and probably more severe difficulties.

DIETETICS.

Breast Milk During the First Two Weeks. The quantity and quality of breast milk during the first two weeks of the puerperium has been studied by Effa V. Davis.[1] Reports were gathered of 100 cases under observation about two weeks in hospitals only. The infants were applied to the mother's breast shortly after birth, within the first six hours usually, and every six hours afterward for the first day, every four hours on the second and every three hours on the third day. Thereafter the interval was determined largely by the quantity of milk obtained and the condition of the mother's breasts.

On the infant's record sheet the nurse wrote the weight at birth, and every third day the gross weight, with the hours of nursing and the gain after each application to the breast. The child was carefully weighed just before each nursing and again after completing the meal. The

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(1) Jour. Am. Med. Assoc., Oct. 10, 1908,

difference in these weights represented the amount of milk obtained at each feeding. These weights were footed up at the end of the day. In this way there could be obtained a correct idea of the quantity of food received in 24 hours and the management of the feeding could be more accurately judged.

Of the 100 infants, more than 60 regained by the end of their second week the weight lost after birth, while 40 did not regain the weight lost or remained the same as at birth when discharged. The loss of weight varied greatly in the first four days of life, sometimes because of the tardy response of the breasts of the mother and at others because of the apparently slight ability of the child to obtain and digest its food.

The first appreciable supply of milk was received in 24 cases on the first day of life, in 41 on the second, in 31 on the third, and in one on the fourth day. All of these babies were receiving breast-milk on the fourth day; so that it is evident that only rarely is there nothing for the child by that stage of the puerperium, though in a few cases it did not come to the infant in anything like the normal amount until the fifth or sixth day.

The average quantity received on the first day was ⅔ oz., on the second 1¼ oz., on the third 1⅞ oz., on the fourth 5 oz., on the seventh 13 oz.

It was noticed, as these records were made, that whenever an infant received an unusual amount of milk for 2 or 3 days, the number of feedings in 24 hours was decreased, because the child naturally declined to be fed, going into a sound sleep and refusing to be aroused at the shorter nursing period. After the amount of breast-milk began to reach 2 oz. at each nursing an interval of 3 hours was found about right for the comfort of the child, and when an occasional 3 oz. meal was taken, 3½ hours and even 4 hours at night was satisfactory in the second week.

It is evident from this series that an average infant requires from 14 to 18 oz. of breast-milk daily to make satisfactory progress, though some will gain on less; many vigorous babies above the average in weight can take care of 20 or more ounces to advantage.

The breast-milk was analyzed in 8 cases to test the quality of the secretion on the fourth day of the puerperium. Five of these cases were again examined on the 14th day. Upon comparison with the average mother's milk given by Holt, this early milk was found to have the percentage of water slightly higher, also of ash and proteid; the fat was considerably lower and the carbohydrates as well. It might be inferred, then, though the number of cases is rather small to draw conclusions, that nature has provided for the early days of life a slightly more dilute milk, rich in ash and proteid, but poor in fat and sugar.

The writer's conclusions are:

1. The system of estimating the quantity of breast-milk by weight is decidedly helpful in determining a feeding schedule for the newborn.
2. Both mother and child must be considered before a thoroughly useful law can be established.
3. The early secretion from the mother's breasts is useful in sustaining the child and babies should be encouraged to nurse from the first day of life in every possible case.
4. When the milk is abundant, an interval of 3 hours between feedings soon becomes the shortest that is satisfactory during the day, but at night a longer interval can be sustained with benefit.
5. Both the digestive capacity of the child and the quality of the breast-milk may enter into the results in a given case exclusive of quantity and the interval between nursings.

Feeding Newborn Infants with Conserved Human Milk. Mayerhofer and Pribam,[1] in the Children's Clinic of Franz-Joseph Hospital, fed twelve newborn infants with conserved human milk with excellent results. They claim that human milk can be conserved and utilized in feeding infants without deleterious effect on the milk or lessening its nutritive value. They find it much better than cow's milk in building up premature and debilitated newborn infants, unable to receive breast-milk directly from the breast. The milk can be cheaply prepared and distributed.

The milk from the various sources is collected and

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(1) Wiener klin. Woch., July 1, 1909.

mixed. To each litre 0.2 c.c. of a concentrated hydrogen peroxid solution (30 per cent Merck's Perhydrol) are added and the bottles fitted with rubber corks and glass stop-cocks. The bottles are then placed in an Ostwald thermo-regulated water bath at 50° C., shaken frequently and warmed for about an hour. At the end of this time no more gas is evolved and the stop-cocks are closed and the milk cooled. The milk is then put in the ice-box and used when needed.

Observations on Nursing Mothers. S. Jacobins[1] examined the milk of 180 nursing women. Fifty-one per cent. were not menstruating (6 mo. postpartum). During menstruation he could not find any change in the milk which would warrant weaning. Twelve times he found a loss of weight and slight changes in the general condition—restlessness and dyspeptic stools.

Remarks on the Feeding of the Healthy Infant. J. Brennemann[2] believes that an overwhelming mass of evidence has appeared in the last few years that discredits the fundamental principles of percentage feeding of infants.

What to Feed.—The most serious question is what to feed a newborn baby unable to get mother's milk. Practically, it is found that the great majority of newborn babies bear well after the second day of life (and no baby should be artificially fed before that time) a dilution of one part of milk with two parts of water, with the addition of a small amount of milk sugar, say ¼ to ½ oz., in the 24 hours' food. This dilution can be strengthened gradually until the baby takes equal parts of milk and water with ½ to 1 oz. of milk sugar daily during the second and third months. The proportion of milk is gradually increased, that of water and sugar diminished till about the end of the first year, when the child is put on whole milk. The total 24 hours' food should not exceed one quart. After the fifth or sixth month the ability to digest starch is so well established that the diluent of water is replaced by one of the cereal waters or gruels. In the latter months of the first year additional food is given

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(1) Archiv f. Kinderheilk., Bd. 48, H. 1-2, No. 3.
(2) Jour. Am. Med. Assoc., July 11, 1908.

in the form of broths, strained vegetable soups, beef juice, fruit juice, zwieback, cracker, cereals, etc.

Frequency of Feeding.—Never during infancy is it desirable to feed the baby oftener than 5 or 6 times in the 24 hours, and toward the end of the first year the number of feedings should not exceed four. This gives approximately a 4-hour interval between the feedings, and this interval in the great majority of cases should obtain from the start. It is a well-established fact that the stomach of a baby fed on cow's milk is not emptied for at least 3 hours after feeding. Babies fed every 4 hours cry less than those fed every 2 or 3 hours for the simple reason that babies cry oftener from digestive and nutritional disturbances than from hunger.

Quantity of Food.—The question of how to feed a baby is only partly solved when the decision is evident of what and how often he should be fed, for there still remains the amount to be determined. When a healthy infant gets more milk than he ought to have, he commonly gains for a time at an abnormal rate, say, from 8 to 12 oz. a week. This is pretty regularly followed by a pause, unless the amount of food is reduced or changed in a certain way. If the amount of the same food is still further increased, there may be another gain, but the child will finally begin to lose. Unchecked, the ultimate outcome of this overfeeding is marasmus. This paradoxical loss in weight with an increase in food is accomplished by other signs of a fundamental nutritional disturbance. The child grows restless, has only broken sleep and cries a great deal. He becomes pale, flabby, and inactive, often rachitic. There develops a marked tendency to itching eruptions that vary from the small, rough reddish spots on each cheek to the most extensive universal infantile eczema. Usually the child grows indifferent to the bottle, requiring much coaxing to take it, or in severe cases finally taking only an ounce or two at a time.

This condition resulting from overfeeding is always accomplished by a characteristic appearance of the bowel movements, in itself showing that the child has had too much milk. The stools lose their normal yellow color, become pale yellow or in severe cases have the color and consistency of soft putty. They are no longer normally moist, and soft, but become hard and brittle, so that they will roll from the diaper, without leaving it soiled. This condition naturally produces very marked constipation. Whenever such bowel movements appear, it means that the child has had too much milk, or, more properly, too much milk fat, because it has been shown that these stools are composed largely of insoluble fatty-acid salts.

At any time in this chronic process of milk overfeeding the whole clinical picture may suddenly change to one of acute catastrophe. In many infants these sudden upheavals occur regularly whenever milk is added to a certain amount. This upsetting, so frequent in artificial feeding, is manifested clinically by vomiting, indigestion, diarrhea, loss in weight, fever, inability to stand food, especially milk, stupor or restlessness. If the disturbance is severe, there are all the evidences of intoxication, including leucocytosis, albuminuria, glycosuria, dyspnea, collapse and, especially, psychic depression. The condition may vary from a mild indigestion to an intoxication so intense as to be rapidly fatal. The more serious cases occur more commonly during hot weather because the child is already debilitated by the heat and is relatively overfed since so much less food is required to maintain heat and energy.

The acute catastrophes or intoxications likewise give their warnings. The prodromata that are always present may be of very short duration, or they may extend over weeks and months and should always be heeded. There is evidence of indigestion in the general condition of discomfort and the character of the bowel movements; the weight curve shows wide variations with a general tendency to remain about level or go down. Still more important, there is an abnormally variable temperature curve with occasional spurts of fever and an increasingly narrow tolerance for certain food elements, notably the fat and the sugar. If these warnings are heeded and all food is withheld for 24 or 48 hours, while the child is on a water or tea, or cereal water diet with saccharin (gr. 1 to the quart) to sweeten the food, the danger is avoided. If unheeded and especially if the food is increased, because the child is losing, the intoxication is almost inevitable.

Fortunately there are certain numerical standards as to the amount of food that the normal infant should get.

Bodyweight versus Age.—The writer believes that the amount of milk should vary according to weight rather than according to age. It has been found that 1 oz. of milk to the pound of bodyweight is about a minimum on which a healthy baby will thrive as he should; that 1¼ oz. is the more usual amount, and that there is decided overfeeding when 1½ oz. to the pound is approached. A healthy baby of 12 pounds should, therefore, have at least 12 oz. of whole milk in the 24 hours' food, more commonly 15 oz., and rarely if ever, so much as 18 oz. It must be distinctly understood that this is not a definite rule applicable to every healthy baby. The important point is that the milk requirement of the great majority of healthy babies who are thriving on milk dilutions like the above has been found empirically to lie between one and one and a half ounces to the pound of bodyweight. This simple guide is most useful in infant feeding. It is, of course, of no value in feeding a sick baby, because here the limit of food tolerance is quickly reached and only so much as the baby can digest and assimilate in the abnormal condition can be given.

A still more useful standard, because it can be applied to all kinds of food combinations, is the calorimetric, according to which the food requirements are expressed in calories per pound, or per kilogram of bodyweight of baby. To Heubner belongs the credit of having accurately determined the number of calories per kilogram of bodyweight used daily by the healthy, thriving infant. The so-called "energy quotient" he placed at a maximum of 100 for the first six months, the amount gradually lessening after that to about 80 or 85 at the end of the first year. He considered 70 as the approximate energy quotient on which weight equilibrium would be maintained.

The process of determining the energy quotient in any given case is simple. It is necessary to remember only a few figures representing the caloric value of one ounce of each different food used for infants. Thus cream (16 per cent.) has a caloric value of about 54 to the ounce; milk, 21; flour or cereal, 100; fat-free milk, 10; sugar, 120;

cereal water, 2 or 3, etc. To calculate the energy quotient it is necessary only to multiply the number of ounces of each ingredient of the food mixture by its caloric value, to add the products, and divide the sum by the number of kilograms the baby weighs.

Length of Interval Between Feedings. C. G. Grulee[1] believes that for infants the four hour interval between feedings possesses the following advantages:

1. It gives the stomach a period of rest.
2. It makes possible an antiseptic action by the free hydrochloric of the gastric juice.
3. It trains the child to longer periods of rest.
4. It is a strong factor in preventing over-feeding.
5. It acts strikingly in overcoming certain cases of vomiting, probably caused by the failure of the stomach to obtain rest under previous conditions.

It is safe to conclude that the necessary increase in the amount of each feeding does not cause a distention of the stomach and that this method of feeding is perfectly compatible with a consistent gain in weight. If to these advantages is added the practical one that the mother or nurse is put to less trouble, it would seem that a lengthened interval between feedings should at least deserve wider attention and fair trial.

Infant Feeding. D. E. English[2] believes a baby should not be awakened at regular intervals for feeding; his orders are to feed the baby until he is full without regard to the amount taken; not to allow him to fall asleep too soon, but to arouse him, shake him up, and induce him to go on feeding until he is surely full, and, perhaps, runs over. This stretches the stomach to its greatest natural capacity and gives the muscle the exercise it needs to develop it. The infant then should be allowed to sleep in the most favorable surroundings as long as he will. A baby sleeps longer out of doors than in the house; longer in a well ventilated room than in a close room; longer in a cold room than in a warm one. It is important that this sleep be as long as possible. When the child wakes he should

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(1) Arch. Pediatrics, October, 1908.
(2) Jour. Am. Med. Assoc., Nov. 21, 1908.

not be fed at once, not until he is hungry. It is unnatural, unphysiologic and unscientific to feed an infant when he is not hungry, or to feed him simply because he is thirsty or fretful. Hunger is the only excuse for feeding a normal infant. If fretful, he should be given water, fresh air, less clothing, soothed, amused, kept quiet and happy in any of a thousand ways before food is given. The period since the last feeding should be disregarded.

Finally the baby should cry, hard as it is to permit. The mother suffers, the people around are annoyed, but it does the baby great good. It is the best, the most vigorous, the most natural exercise he gets, and it is best taken out of doors. This exercise of crying in some way prepares the stomach for the next load of food. Since the last feeding the stomach has had time to get empty; it has had time to contract and resume its natural tone; it has had time to rest. When the crying threatens to change from the natural cry of hunger to an hysterical or sickly wail, then the baby should be fed and fed full.

The interval between the feedings will be irregular. During the first month they will sometimes be as short as 2 hours, sometimes as long as 4 hours in the day and 6 or even 8 at night. The number of feedings for the first three weeks will average for the 24 hours generally 7, sometimes 8, rarely 9.

The general hygienic treatment of an infant is inseparably connected with the success or failure of the method of feeding. Anything that tends to develop the general musculature will also help the stomach muscle to grow. Fresh air, cold air, flowing air, the air bath, the cool water bath, light clothing, absence of coddling, and the exercise of crying, all these things help the infant to digest his food and properly to develop the stomach.

Under this plan of feeding and general treatment it is often astonishing how easily the milk is modified to suit the baby. He soon can successfully handle any modification that comes at all near being what is considered proper for his age. If an infant is fed in this way, kept out of doors, and not overclothed, he soon develops remarkable powers.

Is Sterilized Milk a Safe Food for Infants? E. M. Sill,[1] considering the question of sterilized milk for infants, says that from careful and wide clinical observation, confirmed by chemical research and bacteriological findings, it must be concluded that the advantages of raw milk, when properly used, far outweigh any that highly heated milk may possess. If milk is heated at all, it should never be raised above a temperature of 140° F. for from 20 to 30 minutes.

The Use of Lactic Acid Milk. C. E. Carter[2] summarizes his conclusions on lactic acid milk in infant feeding:

1. Lactic acid milk is obtained from clean fresh cow's milk, fermented by the lactic acid bacillus. The degree of acidity is limited by the time allowed for the activity of the bacillus.

2. Buttermilk feedings and lactic acid milk feedings are absolutely distinct. The former afford an uncertain and temporary expedient always, and being a spontaneously soured milk it contains generally, besides the lactic ferments, yeasts which produce alcohol.

3. With lactacid modification of milk the frequent desiderations of high proteid percentages may be found not only possible but safe.

Lactacid milk is logically indicated (a) in difficult feeding cases, (b) in fermentation diarrheas and (c) in the specific infections of typhoid and tubercle bacilli.

Lacto-Farinaceous Regime. C. Ferreira[3] has made a study of the feeding of farinaceous foods to young infants suffering from gastroin-testinal disorders. He lays great stress on their importance in this class of disorders and draws the following conclusions:

1. Wet nursing as a therapeutic measure has been laid aside in many instances because of insurmountable inconveniences.

2. In milk dyspepsia and in catarrhs of the large and small intestines accompanied with toxic manifestations and marked putrefaction of albuminoid substances of farinaceous diet serves to produce a certain intestinal antisepsis and to put the digestive tract at rest.

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(1) N. Y. Medical Journal, Feb. 8, 1908.
(2) N. Y. Medical Journal, 1908, LXXXVII, p. 642.
(3) Archiv de Med. des Enfants.

3. In the frequent cases of milk intolerance which appear among children up to two and one-half years old a lacto-farinaceous diet constitutes a valuable agent in dietetic therapeutics.

4. When, after the disappearance of the acute symptoms in toxic infections of the digestive tract and acute gastroenteritis under the influence of a water-diet, it becomes necessary to modify the régime, farinaceous foods afford excellent nourishment before the return is made to an exclusive milk diet.

5. The farinaceous and lacto-farinaceous diet ought not to be forgotten in the dietetic therapeutics of the dyspepsias, chronic gastroenteritis, catarrhs of the large intestines, and in convalescence from acute gastroenteritis of infants.

The Distribution of Bacteria in Bottled Milk. A. Hess[1] thus summarizes the results of his study on the distribution of bacteria in bottled milk:

In bottled milk the bacteria are by far most numerous in the upper layers of the cream, gradually diminishing in its lower portion. The upper two ounces contain the greatest number of bacteria. This is true of tubercle bacilli as

This is true of tubercle bacilli as well as of streptococci and other bacteria.

well as of streptococci and other bacteria. Therefore, instead of using the upper cream, as is now practiced, it is preferable to discard the upper two ounces.

The average bottle of such partially skimmed milk contains 3 per cent. fat and 3.5 per cent. proteid and is well adapted for infant feeding. If the upper two ounces are discarded there is left—next 7 ounces, a 12 per cent. milk; next 8 ounces, a 10 per cent milk; next 12 ounces, 7 per cent. milk. With these figures as a basis the usual top milk formulæ may be prepared.

The Bacterial Content of Whey. Oscar Schloss[2] performed two sets of experiments to determine the bacterial content of whey and the milk from which it was prepared. In one set the whey was prepared in the kitchen with ordinary cleanliness and in the other strict asepsis was

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(1) Archives of Pediatrics, August. 1908.
(2) Archives of Pediatrics, June, 1909.

employed. His experiments show that in the rennin coagulation of milk many of the bacteria are included in the clot and the whey contains far fewer bacteria than the corresponding milk.

Food Intoxications in Childhood. Ruhräh[1] states that overfeeding produces many untoward symptoms. These may be caused by too much food of all kinds, or by too much fat, protein or carbohydrate. It is not possible to separate a symptom-complex of each one of these conditions, although some light has been thrown in this direction.

Taking of too much food of all kinds produces recurrent attacks of fever, headache, coated tongue, foul breath, malaise and other drowsiness, vomiting, diarrhea and an enlarged tender liver. A purge and a limited diet usually clears up the situation.

Too much protein causes, as a rule, much the same symptoms. Sometimes one symptom is especially prominent, as recurring headache, neuralgia or attacks of vomiting, or in the milder cases only a furred tongue and foul breath.

Children are overfed with fat often intentionally to improve the nutrition. But the condition grows worse, the skin is pale and muddy, the tongue coated, the breath fetid and the stools frequent, containing undigested fat.

Overfeeding with carbohydrates is the most common type. The attacks are periodic and the commonest form of attack is recurrent vomiting, although any of the other symptoms of overfeeding may be present.

The author states that the cases must be studied to find the disturbing element or elements, and cites cases cured on instituting the proper diet.

Salt, Sugar and Fever. Finkelstein[2] in working with the gastrointestinal disorders of infancy came across a phenomenon which he called alimentary fever. This is called forth with absolute certainty by giving to an infant instead of water or tea a sugar solution, as 100 c.c. of lactose, 12.5 per cent.

R. Roume found that neither casein nor fat would cause

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(1) Jour. Am. Med. Assoc., July 10, 1909.
(2) La presse Med., Feb. 20, 1909.

the febrile reaction. Finkelstein believes the sugar action to be purely mechanical and physical, that the normal intestinal mucosa could neutralize the toxicity of the sugar while absorbing it by binding it and some organic molecule and that in the dyspeptic this power was in abeyance. Subcutaneous injections of an isotonic solution of sugar also caused fever, possibly by disorganizing the body cells.

Salt solutions of 3 per cent. caused similar febrile reaction in healthy and sick babies while 1 per cent. solutions scarcely affected the well babies and 0.75 per cent. solutions were innocuous.

Nutritive Disorders in Children and their Treatment. The following translation from Prof. E. Feer,[1] Director Heidelberg University Children's Hospital, is presented as a practical dissertation and a fitting conclusion for the section on dietetics:

"Artificial feeding of infants in the first two years of life presents peculiarities in digestion and assimilation and also certain pathological changes which occur at no other period of life. The nutritive disorders present the most important chapter in early childhood and are also the most difficult. They present the most inviting field for scientific work and during the last 10 or 15 years, pediatricians have been rendering diligent service along this line. The disease effects occurring as results of improper artificial feeding in infancy are so different from the diseased condition in later childhood and adults, that they require a special study and the most intense interest of the pediatrician.

"A universal and satisfactory classification of digestive disturbances has not been written and nearly every author has his own classification. Formerly it was the custom to endeavor to make anatomico-pathological divisions, with reference to clinical symptoms and bowel movements. This classification is referred to as dyspepsia, bowel catarrh and enteritis. A classification according to anatomic distinctions is for the most part unsatisfactory. For example, the so-called cholera infantum: postmortem examination shows the gastrointestinal canal to be nearly intact. An exception to this is found in cases of follicular enteritis or ileocolitis. A distinction between gastric and intestinal diseases is practically impossible (pyloric stenosis). Physi-

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(1) Bull. Chicago School of Sanitary Science, July 31, 1909.

ologic research at the present time shows the dependence of various portions of the digestive tract one upon the other, and in infancy, diseased conditions tend to involve the whole tract rather than any isolated portion.

"The division still adhered to, such as dyspepsia, intestinal catarrh and enteritis, is convenient, though it is not well founded, or directly applicable. How often we find in the same patient in a few days a rapid change in the character of the stool; so that yesterday we might have spoken of dyspepsia, today of intestinal catarrh, and in a few days of enteritis. As a matter of fact, it often depends on the nature and quantity of food. Frequently we are in the embarrassing condition of doubt as to what appellation to give the diseased condition; and if a case comes to autopsy, there is hesitancy about what diagnosis should be given the pathologist. Fortunately for the clinician, after the autopsy the pathologist is often in the same condition.

"Czerny and Kellar first showed that the earlier classifications of intestinal disturbances are too narrow; that aside from the disturbances in the chyme and gastrointestinal mucosa, pathologic changes occurred in the intermediary metabolism and that these latter changes played a most important part. They therefore introduced in place of the older, narrowed view, the term 'disorders of nutrition,' and this designation has received universal recognition. One is not seldom called to witness a fatal case of nutritive disorder where normal feces are evacuated. The subdivision of the nutritional disturbances presents great difficulties.

"Czerny and Kellar present the following principal groups: (a) From infection; (b) from alimentation; (c) from constitutional sources.

"This is not like the older attempts to differentiate the alimentary from the infectious disturbances. In practice, this classification is difficult to maintain, as it is almost impossible to tell where an alimentary disturbance stops and an infectious one begins. If a previously healthy infant with a normal digestion suddenly is given a great increase of food and thereupon acts with disturbance of digestion, it may be spoken of as an alimentary disorder. If, on the other hand, a child that is progressing normally suddenly takes sick with fever and discharges mucopurulent feces, and if the fever continues after protracted starvation diet, or if other members of the family fall ill with a similar disease, we surely have to do with a genuine infectious enteritis. Most often, however, the conditions are not so clear and the etiology is uncertain. The more we inquire into the nature of the nutritive disorders, the more we are impressed with the fact that ectogenous and endogenous infections play only a subordinate rôle, that most of the nutritive disorders are of alimentary origin, even if in the later course of the disease infections occur secondarily and, by producing toxins and through bacterial invasions become destructive.

"It must not be denied that specific infections of the chyme and intestines, especially in the summer, do occur, as, for example, streptococcus infection of Escherich and genuine dysentery. Clinically, alimentary and infectious disorders are difficult to differentiate. We see not infrequently the enteric stool, with blood and pus, in course of an alimentary infection. Fever does not always indicate infection. Only a short time ago, Finkelstein showed that pure alimentary injury might lead to fever. There are those who think, perhaps correctly, that the alimentary intoxications of Finkelstein are composed not only of the alimentary component, but possibly also of bacterial invasion and activity.

"Czerny and Kellar consider under the nutritive disturbances which are of alimentary character that the disturbances may be produced by foods which are quantitatively or qualitatively unsuited, though not in any way decomposed. These are the disturbances produced by milk, the disturbances by starch; or in other words, milk-dyspepsia and starch-dyspepsia.

"The most widespread and most important disturbance is that produced by milk. This occurs frequently in children who are exclusively, or for the most part, fed with pure cow's milk, or who are fed excessive quantities. In these cases, the weight becomes stationary and if the milk be increased still more, the baby loses in weight, which may eventually lead to atrophy. As a characteristic point in this form of disturbance may be noted the dry, hard, gray or white, strong alkaline stool, which is extremely fetid in odor and which is designated as a fat-soap stool.

"Owing to the insufficient absorption of milk fat, fatty acids separate, which combine with the alkalies of the body (especially sodium) and also the earthy alkalies, and produce 'alkalipenie' and lead to a relative acidosis in the intermediary metabolism. Further indication of the milk disorder is the increase of ammonium excreted in the urine, anemia, excessive sweating, meteorism and diminished tonicity of muscles.

"The disorders produced by starch occur more rarely. They are most often observed where an exclusive starch diet is given; in these cases sugar is usually administered. The feces are not so characteristic as in the cases where milk diet produces derangement, but are brown, offensive and react acid. After continuing for a while, mucus is produced and decomposition, as evidenced by foul-smelling feces, develops.

"At first, the tonicity and general appearance seem normal and there is no thought of illness. Later, atrophy occurs with hypertonicity of muscles, most marked in the lower extremities, and one usually finds increased electrical irritability of the peripheral nerves. Atrophy occurs most readily where milk and the mineral salts are withheld. A special susceptibility to secondary infection is noted. Thrush, otitis, pneumonia, abscesses and furunculosis may occur, and the children show diminished resistance.

"Czerny and Kellar deny the occurrence of injury produced by milk proteids. Formerly the important distinction between breast milk and cow's milk depended upon the conception that cow's casein was precipitated in coarse flocculi and was difficult of digestion. To many physicians, the coarse precipitate, difficult of digestion, is a tradition, hard to overcome. One can convince himself that the casein coagula in boiled and thinned milk fall down as fine flocculi. Biedert believes that the large proportion of casein of cow's milk produces an injurious product of digestion in the lower part of the bowel, and in this way leads secondarily to decomposition and toxemia. Biedert contends that the white flakes in the dyspeptic stools are undigested casein. Closer observation discloses that they are mostly fat and fat-soaps; that the decomposition in the intestine proceeds from the intestinal secretions and that the casein of the cow's milk is nearly as well digested as that of breast milk.

"The proposition then seems proved that casein of cow's milk causes no intestinal or digestive disturbances. Czerny and Kellar feel justified in excluding the possibility of an injury produced by casein, and in this they are corroborated by nearly all of the more recent authorities, in opposition to Biedert and his pupils. Feer, the author, thinks, however, that the injurious effects of casein are possible. He says that the injury perhaps does not occur in the intestine, as maintained by Biedert, but in the intermediary metabolism. Agreeing with Huebner, Feer thinks that artificially fed infants use up more energy than breast-fed babies, and he thinks that with breast-milk the least energy waste occurs.

"An excessive amount of proteid is an irrational method of feeding, because it is delivered to the organism as an unusable ballast.

"It is a remarkable fact, not usually considered, that only 7.5 per cent. of the caloric value of the infant's food is composed of proteid; in the calf, 21 per cent. is proteid. The energy consumption need in state of health is 100, so the organism requires to prevent fall 106 of sugar, 114 of fat and 140 of proteid.

"In conclusion, the point may be brought out that the feeding of an infant with cow's milk causes excessive work on the part of the infantile digestion and metabolism, and takes place at the expense of excessive energy production, and this in itself may produce permanent injury to the organism.

"It seems that we are justified in speaking of proteid injury in other directions. While the fat and the sugar perform their tasks by a relatively simple and uncomplicated chemical process and are consumed without residue, we must conceive that the proteid must undergo a complicated process, particularly in its reduction to urinary end products, and in this way require from the intermediary metabolism and the kidneys a useless labor, for the most part, if in excess.

"The organism is in a position to absorb large quantities of proteid as the most important constituent of the food, and has the power in times of nutritive disturbances and loss of body weight to retain nitrogen. If proteid is given in excess though, the nitrogen is not retained.

"From clinical observations, it seems apparent that excessive ingestion of proteid may produce injurious results. It is striking that often the severest disturbances of nutrition, which occur under the picture of cholera infantum, attack those children who have been fed with whole milk, and where there was no apparent difficulty with fat digestion disturbances, which are more infrequent with a high fat and low proteid milk. One must think of the possibility that in the feeding of excessive and useless proteid, the metabolic function is overloaded and fatigued, so that eventually every function becomes paralyzed for the elaboration of the fat and sugar.

"One may also consider injuries produced by the inorganic salts. The mineral metabolism of infancy is not sufficiently elaborated, to speak in any dogmatic way. But the work of L. F. Meyer (Breslau) and others has called attention to this subject. The salts of human-milk whey are qualitatively, and particularly quantitatively, different from that of cow-milk whey. This difference may result in some harm to the infant. Meyer has shown that in certain disturbances of infancy, cow-milk whey may produce certain disturbances, while breast-milk whey, with the addition of fat and proteid from cow's milk, is well borne. On the other hand, cow-milk whey, with addition of fat and proteid from human milk, is poorly borne; in other words, the whey of cow's milk seems capable of causing more digestive disturbances than the whey of breast milk in this experiment.

"Nowhere can we see more distinctly how water osmosis depends on salt metabolism than in the infant. It is possible during the period of starvation to prevent for days loss of weight by the administration of salt solutions; or if a marked increased amount of salt solution is given, edema may be produced. The salts contained in whey act similarly. In the disturbances of nutrition, a poverty of mineral salts often exists, which occurs in the highest degree in cases of prolonged starch feeding, but also in those cases where injury is produced by milk. As a matter of fact, the injuries produced by mineral salts are frequently combined with injuries combined with other elementary food stuffs. An independent injury produced by mineral salts has recently been the theme of Finkelstein. He thinks that the constitutional infantile eczema is due to an excess of mineral salts in the organism. Finkelstein treats these eczemas by diminishing the amount of salt. To do this, he diminishes the whey by taking away four-fifths of the entire quantity and by the addition of the normal amount of fat and proteid to the milk. It has been questioned in several quarters whether the diminution in quantity of mineral salt is capable of curing the eczema. Other clinicians have found that by diminishing the fat as well as the salt, an effective treatment for eczema was at hand.

"Finkelstein has recently suggested a method of testing the function of nutrition in the alimentary tract and in the entire organism. He gives a certain quantity and quality of food and then notes the reaction. He observes four stages of nutritive disorders.

"In a carefully proportioned diet, the increase of diet produced bad stools and temperature exacerbations. In the stage of decomposition, the tolerance for fat, and later for sugar, is severely damaged. At this point, reduction in weight occurs and exacerbations of temperature.

"The severest degree of nutritive disturbances is marked by the condition Finkelstein calls intoxication. Disturbances of consciousness, deep respiration and alimentary symptoms occur, a condition formerly known as intestinal catarrh. There exists now a condition of alkalipenie in the intestine and acidosis in the blood. The intoxication does not depend upon any specific intestinal flora, or any acid reaction of the intestinal content.

"After considering all of these elementary points, it must be admitted that no satisfactory classification of disorders of nutrition is at hand. Indeed, it may be asked if it will be possible to find an inclusive classification which will be universally acceptable, especially in view of the extraordinary complexity of these disorders. We have to deal with an admixture of alimentary, toxic, microbic and constitutional disorders. Frequently it is impossible to differentiate acute from chronic disorders. Frequently one learns only after the lapse of some time that disorders occurred apparently suddenly, though for a long time previously there existed bad feeling and diseased symptoms which were not noted.

"The clinical examination and estimation of the condition of the stool was formerly considered the most important single feature. The character of the stool is one of the most important indicators, but it is well to associate it with temperature, weight, general appearance, psychic state, tonicity of muscles, etc. In order to control the daily feeding, it is well to observe closely the stool. A short review of the appearances of the infant stool will not be out of order. In the breast-fed baby, we observe the so-called normal breast stool, the golden yellow color, the pastelike, homogeneous consistency, and the faintly sour, not unpleasant odor. Occasionally there are frequent stools, containing a slight amount of mucus and some white flakes. Sometimes they tend to become rapidly green. Unfortunately, mothers and nurses will wean the baby on these latter indications and start artificial feeding. If the physician examines not only the bowel movement, but also the general condition of the child and finds the general condition good and the child progressing, he is convinced that there is no reason to wean the baby and expose it to the dangers of artificial feeding. Most of these children are simply overfed, and if they are given the breast less frequently, the stools usually improve in appearance. Many healthy breast babies never have quite normal stools. The stools of some babies fed with cow's milk are usually thin and show numerous white flakes, which are probably fat residue; or the stools may be bright yellow, which upon being broken present a white, shiny appearance. Sometimes the stool has a slight odor of decomposition, accompanied by a slight alkaline reaction. It is not the casein that has undergone alkaline decomposition, but the intestinal secretions themselves. In cases of protracted starch feeding, large quantities of mucus undergo processes of decomposition and contribute to the odor.

"The reaction of the cow's milk stool is usually alkaline.

This is true also of buttermilk. Acid reaction indicates insufficient digestion of the fats or of the carbohydrates. In cases of incomplete fat digestion, one often notices fatty acid crystals, as well as neutral fat and fatty acid soaps. These stools often smell rancid like butyric acid. In cases where the acid reaction results from insufficiently digested carbohydrates (sugar and starch) one observes frequently the emission of considerable gas or a foaming fluid evacuated, which has a strong acid odor resembling acetic acid. Insufficiently digested starchy food may be detected by the iodin reaction.

"It is frequently noted that starch may be digested by itself, while if milk be added the iodin reaction is observed, indicating that the addition of milk under some circumstances interferes with starch digestion. Staining of the stool smear by the method of Weigert-Escherich serves to differentiate a normal breast stool (gram positive bifidus) and cow's milk stool (gram negative coli) from the pathologic stools (staphylo-streptococci).

"If we review the remedies which we have for the treatment of nutritional disorders of infants, the most important is breast milk. Whatever else may be said or claimed about infants' food, it may be noted that up to the present time there is no artificial method of procedure known which can be instituted with certainty from the first days of life.

"If an infant receives breast milk during the first four weeks, or the first fourteen days, or even the first week, we may say that his chances for an undisturbed development are increased.

"The details concerning the quality of milk and its production on the farm are such well known facts that they are not mentioned here.

"Formerly, the plan of feeding rested entirely upon the endeavor to make cow's milk resemble, in its chemical composition, breast milk. Special stress was laid upon the casein, or upon its digestion in various ways. Numerous observations and metabolism experiments have shown that casein of cow's milk is well digested and that the fat is to be feared. It is a matter of general experience that in digestive disturbances, fat-free milk gives brilliant results.

"Milk must be obtained by the centrifugal process. By the mere skimming of milk with a spoon, a product is obtained which contains 2 per cent. fat. Whey is a very valuable food substance and differs from fat-free milk only by the absence of casein and a smaller quantity of mineral salts. The fact that there appears to be no difference in the digestibility of fat-free milk and whey indicates the ease with which the casein is cared for. Mineral salts are an important addition to the infant's dietary and it is possible that the value of whey and fat-free milk in digestive disturbances depends upon the salt content.

"The carbohydrates occur in artificial foods in the form of sugar or the various infant foods. Milk sugar in artificial feeding is a valuable addition; in some cases it aids in fecal evacuation and it seems to ferment in a normal way in the intestinal tract and assists in maintaining the normal flora of the bowels. It is not clear why milk sugar in artificial food seems to contribute less to an increase in body weight than other forms of sugar. Cane sugar may be given to infants who are more than three months old without injury. In excessive doses, it causes acidity and dyspepsia.

"Maltose is extremely valuable. Its greatest value consists in the fact that it is split up in the bowel and is readily assimilated. If maltose is given in any excessive quantity, the stool becomes acid and diarrheal. Kellar's Soup is recommended, as is also Soxletsche Nähr Zucker.

"Among the insoluble carbohydrates may be recommended flours from wheat, rice and barley. Three per cent. decoctions may be made, using these flours, boiling them for 30 minutes as recommended.

"In the treatment of nutritional disorders of infancy, it should always be the endeavor to gradually bring the food to such a strength as would be indicated for a child of the same age and weight in health. The quantity of diluted or undiluted food for a normally developed infant during the first weeks should be from 100 to 500 gm. (3 to 15 oz.) a day; 700 gm. (20 oz.) in the fourth week; 800 gm. in the eighth week (26 oz.); 900 gm. in the third month (30 oz.); 1,000 gm. from the fourth to the sixth month (33 oz.), and to the end of the year 1,200 gm. (40 oz.).

"In nutritional disorders, the same quantities may be given if the body weight is not much below that which it should be for a child of its age. In cases of severe nutritive disturbances when only small quantities of food are given, it is advisable not to dilute the milk very much. The cow's milk should be diluted in the following way: One-third milk, two-thirds water in the first week; three-sevenths milk, four-sevenths water in the fourth week; from then on, four-eighths, five-ninths, seven-tenths, eight-tenths milk from the second to the sixth month.

"To estimate the quantity, the excellent rule of Budin, which calls for a daily amount of milk equal to one-tenth of the body weight, may be employed.

"From the second month, small quantities of starch may be added to the milk, increasing 5 grams monthly, so that at the sixth month 20 to 30 grams are added.

"The number of meals should be reduced to five at the end of the first month. New-born babies may be given six feedings at the most. In nearly all of the digestive disturbances, five meals are held to be the correct number. If there is great weakness or severe emesis, eight to ten meals may be given; or it may be necessary to give meals in teaspoonful doses every half to one hour.

"In order to maintain normal health, the child should be given a sufficient quantity of food. Overfeeding is one of the most important causes of disease. As a control of the amount of food, the number of calories for the body weight should be calculated. According to experience, a healthy child requires for each pound of body weight 45 cal. in the first three months, 40 to 45 cals. in the second three months and 32 to 35 calories at twelve months.

100	gm.	of	whole milk or buttermilk	700 C.
100	"	"	malt soup	80 C.
100	"	"	fat-free milk	40 C.
100	"	"	whey	20 C.
100	"	"	oatmeal water 3%	12 C.
100	"	"	barley water	5 C.
100	"	"	flour-sugar	100 C.

"Premature and atrophic children often require 140 to 120 calories. The energy quotient offers a useful scale. It would be missing a point if one thought that he were dealing with an absolutely positive method. The individual requirements vary greatly. For example, the salts which are not considered in the caloric consideration are of great importance.

"Frequent weighing of the infant on reliable scales is of great importance; the infant should be weighed every second day. The food should not be increased as long as the child is gaining in weight. It is a mistake to think that an increase in the age of the child indicates an increase in the strength of the food.

"The interpretation of the changes in weight is not easy and requires considerable experience if one would not fall into error. Very striking are the increases in weight which take place when foods of low value, or containing a large quantity of mineral salts (such as whey and skim-milk or even salt solutions) are given.

"These increases in weight may be explained by marked retention of water, later on it is readily lost again.

"*Disturbances in Breast-Fed Children.*—These disturbances are relatively seldom and less severe. Overfeeding, which manifests itself by vomiting and frequent dyspeptic stools, is usually cured by reducing the meals to five per day, and also by short periods at the breast, especially if the milk is unusually rich. In these cases, it is frequently of great benefit to devote one day to giving nothing but tea. The mothers frequently have a deficiency of milk which is often not recognized. Children who are receiving milk from this breast are usually very quiet, notwithstanding the fact that they are suffering from chronic inanition. In these cases, one usually notes small, infrequent and dry stools. Mixed feeding is indicated, though breast milk should be continued at least in part as long as possible, the various lactagogue remedies (Somatose) are of little value.

"*Pyloric Stenosis.*—This occurs most frequently in new born, breast-fed children and, strangely enough, is marked when a child is 10 to 14 days old, when he has apparently thrived. Severe vomiting, the scanty stool, must arouse suspicion for this affection. The diagnosis is confirmed if visible, wave-like peristaltic movements of the stomach become apparent. There is no general agreement as to treatment. Feer recommends breast milk 8 to 10 times daily in qualities from 2½ drams to 1 ounce at a feeding.

He prefers breast milk which is low in fat, and therefore selects the fore milk which is pumped from the breast as needed. He thinks that if this milk is cool, it is better retained. He also recommends enemata of normal salt solution, or subcutaneous infusion of this same solution, or enemata of breast milk by rectum. He thinks that cataplasms on the abdomen relieve colic. It is not uncommon to employ gastric lavage. Feer did not receive any good results this way in severe cases. He thinks it does harm.

"In the most obstinate cases, it is advised to use skimmed breast milk, or cow's milk or buttermilk. Breast milk is the most reliable.

"The severe habitual vomiting is a relatively uncommon gastric neurosis, which may occur in well-fed breast children. In these cases, fat-free milk gives good results. This condition must not be confused with the condition occurring in artificially-fed children as the result of over-feeding.

"Most of the gastrointestinal disturbances involve both the stomach and intestine so that it is almost impossible to separate one from the other. The majority of children suffering from gastrointestinal diseases are artificially fed.

"*The Treatment of Acute Digestive Disturbances.*—If the diagnosis of an acute digestive disturbance is made on account of vomiting, bad stools or any other symptoms, the first indication is to stop all food and empty the gastrointestinal tract. These two indications are best met, first, by instituting a starvation day. This is best done in the form of a 'tea day.' One gives the child five meals in the same quantity as if he were drinking milk. Any form of tea may be used, though Chinese tea has the advantage of being slightly stimulating, although in rare cases it produces vomiting. In order to make the tea pleasant to take, a saccharin tablet should be added. Sugar is to be avoided because it introduces an element of food which may undergo fermentation. If the tea is not taken, or if the child vomits, it should be given in smaller doses and more frequently, or it may be given cold. Tea should be continued sufficiently long until the evacuation from the bowel contains no food residue. One may speak of this bowel movement as a 'starvation stool;' it consists of thin brown intestinal secretions. The time for this varies; it may occur in 24 hours, or at other times may take from 36 to 48 hours. For a rapid evacuation of the bowel, it is necessary to use a cathartic, though it may be considered a contra-indication if the child is very weak or is vomiting incessantly. Formerly calomel was much vaunted and Feer personally has given it for years and often with good results. It may be given two or three times a day, in ¼ to ½ gr. doses, until the result is obtained. One must remember however, that even in normal children calomel produces pathologic changes in the intestinal flora. One experiences not infrequently unpleasant symptoms of collapse, particularly in weak children, especially with vomiting and intestinal irritation; so Feer notes that he has not used calomel for years, except in infantile eclampsia. Castor oil is much preferable. It may be given in teaspoonful doses three or four times a day, according to the age of the child and depending on the result produced. The action is nearly always the desired one without harmful results. In very young or very weak infants, it is better to omit the cathartic drug entirely. The use of these drugs is superfluous, especially in the mild infections. Gastric lavage or flushing to remove superfluous particles is required only occasionally, although sometimes washing out the stomach with normal salt solution relieves vomiting and distress. Irrigation of the bowels is usually unnecessary. It is indicated in those cases where it is difficult to give medicine or where the use of drugs is contraindicated, especially where the intestinal tract contains fermenting or putrefying contents. In many cases the tea diet suffices. Frequently, however, the indigestion of water is refused or vomiting ensues. The sunken-in fontanelle, the great loss in elasticity of the skin, the loss in weight, anemia, indicate the loss of bodily fluid and the great need of the body for liquids.

"Where symptoms of intoxication or acidosis ensue, such as somnolence, deep breathing, alimentary glycosuria or acetonuria, subcutaneous normal salt infusion serves a useful purpose. Three to six ounces may be injected under the skin and repeated twice in 24 hours. The normal salt infusion eliminates poisons through the kidneys and improves the condition of the depleted vascular system and stimulates the heart. The procedure is indicated in severe collapse. In the latter cases, one to two drops of adrenalin solution may be added to the infusion with good results.

"In the acute cases and those of marked severity, active stimulation is indicated. As is revealed by the examination, the heart tones are weak, the pulse is small, prostration is extreme. One may give twice daily, or as often as four times daily, one-half a syringe full of camphor in oil, or one-fourth to one-half grain of caffein.

"After the starvation period is terminated, one must begin very cautiously with a new food. In the severer cases, one should not begin giving food until the urine is free from sugar, until the rapid, shallow respirations have stopped and the mind is clear. This may last several days.

"If it is necessary to discontinue food for several days, it is sometimes better to give normal salt solution in preference to tea. Since it is known that the salt solution has a favorable effect in those cases where there is a great loss in fluid from the body. This is particularly true in those children who have lost a great deal in weight. Fischel recently suggests a vegetable soup made by boiling two ounces of carrots, two ounces of potatoes, one ounce of turnips, one ounce of dried peas or beans, boiled for four hours in one quart of water in a well closed vessel. The supernatant fluid is poured off, the fluid made up to a quart and a teaspoonful of cooking salt is added.

"How should we begin the feeding after the 'tea day'? It is a matter of experience that the fat as well as sugar assimilation is low and that proteids are most readily tolerated by infants; the older children can take care of the insoluble carbohydrates.

"In the cases of older infants, barley water sweetened with saccharin may be given for a few days and then oatmeal water may be tried.

"If no further disturbance occurs on the second day, 2 to 5 per cent. of sugar may be added to the barley water. If one has tried the cereal waters for several days and the stools are improved, one may cautiously add milk, perhaps an ounce or two, during the first day. If the stools continue bad, it is evident that the milk is not indicated;

it is better to increase the quantity of carbohydrates. If it is impossible to proceed with whole milk, one should use fat-free milk, gradually increasing from three ounces to a pint per day. The results with the fat-free milk are usually very satisfactory. The fat-free milk may be substituted by whole milk, as the condition of the child improves. Skim milk should not be used for too long a time; three to ten days seem long enough in most cases. If the skim milk is continued for too long a period, the infant seems to become intolerant for the digestion of fat. In cases of enterocolitis where milk is digested with difficulty, the malt soup frequently is of great service. Frequently the food agrees best which was not used before the child became ill. For instance, children who were receiving an excessive amount of starch before the illness began can take milk before the acute illness leaves, and vice versa. Children who take milk well at first, take starchy food better after the illness is terminated.

"The treatment of acute intestinal disorders of children from 3 to 6 months old presents the greatest difficulties. In these cases, as in the ones already referred to, short periods of starvation should be instituted and then, if possible, small quantities of breast milk should be obtained if a wet nurse is accessible. One should not wait until the infant is *in extremis.*

"If no breast milk can be obtained, the treatment is more difficult and the outlook more dangerous. The cereal waters may be tried and are frequently well tolerated. Whey and fat-free milk with the addition of water or barley water frequently assist the tiding over this difficult period. In a therapeutic way, the fat-free milk does not differ much from whey, thus showing the comparative harmlessness of casein and the results are much the same.

"In very young infants, it is well to use the whey at first. In the severest cases, where there is great loss in weight and fluids, fats and carbohydrates are not well tolerated. Sometimes there is an intolerance toward proteids on account of proteid decomposition in the body. In these cases, small quantities of breast milk seem to be the only remedy. Particular mention should be made of intoxications which occur in intestinal catarrhs, as in every other form of intestinal disturbances and even occur in breast-fed children. In the acute stages of this condition, even breast milk cannot be tolerated. The fat content of breast milk works harm. Finkelstein has shown that the fat and sugar content produce intoxication and alimentary gylcosuria. In these cases, we are confronted with the almost paradoxical fact that breast milk may not only do harm, but may be fatal. In these cases, tea should be given sweetened with saccharin; sugar is contraindicated. In these cases, after two or more days, when consciousness is nearly restored, and the fever has disappeared, we may give cereal waters without sugar, and later a whey or fat-free milk, not more than two ounces daily the first few days.

"After the starvation period, we may give small quantities of whey or centrifugated breast milk. One should proceed slowly in the use of whole milk and sugar-containing foods.

"A very difficult and unsolved problem is how far may one proceed with the starvation period. One often swerves in the doubt between the sins of commission and the sins of omission. When the nutritional conditions of the child are still moderately maintained and where it can still draw upon its energy for nutriment, one need not fear instituting a starvation period.

"*The Chronic Nutritional Disturbances.*—The chronic disturbances present greater difficulties than the acute ones. The treatment should be begun with a tea diet and cathartic. The starvation period in these cases is not without danger. It has been observed in the chronic cases that weak children who have suffered for months from intestinal disease and with whom a tea diet was instituted, would go into fatal collapse, particularly if at the same time a cathartic was instituted. Even the mild castor oil produces these results. It is evident that a much debilitated child is not in condition to stand a complete abstinence from food, even for a short time. In view of these experiences, it is well to avoid starvation periods and particularly the use of cathartics in children who are much weakened and who are suffering from chronic nutritional disorders. As in the acute disorders, stimulation and infusions of normal salt solution should be employed. The injuries produced by milk and those produced by starch are frequently met with, and like all chronic disorders of nutrition may lead to atrophy. The atrophy should not be considered as a distinct disease, but as the end of a nutritional disorder.

"The injuries produced by milk require a protracted period for correction; sometimes the reduction in quantity of milk is all that is required. If this plan does not avail, if the soapy stools continue, the milk should be reduced to one-third or one-fourth and the carbohydrates increased, especially cane sugar, starch or maltose. If this does not bring about the desired result, the malt soup may be tried. Or, in some cases, the buttermilk mixture seems to give better results, inasmuch as it is inclined to constipate, while the malt soup produces diarrhea.

"Many of the infants who show these injuries produced by milk and have such an intolerance for it that they cannot digest the malt soup or buttermilk, do best if provided with a wet nurse.

"*The Injuries Produced by Starch.*—The chronic starch indigestion often improves when the starch and sugar are withdrawn and milk alone used. In young infants, a wet nurse should be secured, since these patients are particularly threatened with secondary infection, and breast milk conveys the greatest immunity. Older children may be given small quantities of diluted whole milk cautiously increased. In these cases, even fat-free milk is sometimes tolerated the best.

"In many of the severe cases small quantities of breast milk, 3 to 6 ounces daily, as a supplementary feeding, seem to tide the infant over difficult places. Many times one is confronted with the difficult question as to how the food is to be arranged when the stools continue bad for a considerable time. Should we continue a minimum amount of nourishment until the stools become normal, or should we feed the child? A general answer is not possible. The cases must be decided on their individual merits. If the child continues in a state of good nutrition, one may continue with a minimum amount of food. If however the infant is much debilitated, it is positively dangerous to continue so low a diet. In such cases, where there is undoubtedly some disease of the intestinal mucosa, this causing an increased amount of mucus and evacuation by the bowel, although the stool itself seems well digested, the food should be increased. In children who are over six months old, it is frequently an advantage to give animal broth, zwiebach and fresh fruit juice.

"The care of the infant plays an important part. This is evident from the fact that infants sometimes thrive under the most various and irrational feeding methods, while others succumb under the same conditions. Clean rooms, free from dust, clean and frequently changed clothes, clean hands of the nurse, fresh air, are extremely important.

"The children should be carried about, and should be allowed some freedom to exercise their legs. Young infants should be kept warm; delicate infants should not be allowed to chill. One may sometimes note that children who are chilled fall ill with intestinal disorders. While infants should not be overstimulated mentally, the other extreme of leaving them entirely alone and neglected, as is frequently done in children's wards, is equally to be avoided.

"Medical treatment plays a subordinate rôle in these disorders and is frequently overdone in practice. Dilute HCl is sometimes indicated, though the benefits from the use of this drug are not all apparent. The addition of salt to the food, or its administration in some other way, is equally efficacious. The preparations derived from the pancreas are of doubtful value. The use of sour milk, such as is obtained by the use of lactic acid bacilli, is sometimes of distinct value. The astringents are sometimes unnecessarily administered. In cases where there are frequent mucus stools, one often sees benefits from bismuth or tannin preparations. Opium should be used with great caution, though exceptionally it may be used where there is excessive watery diarrhea. Where there is a dysenteric condition, injections of starch water, with the addition of opium, are sometimes required. Baths are indicated, particularly for the reduction of temperature."

RICKETS.

The Etiology of Rickets. Findlay[1] has studied the etiology of rickets and has arrived at the following conclusions: 1. Not one of the many theories which have been elaborated to explain the cause of rickets has been universally accepted and they all lack, not only from the clinical but also from the experimental aspect, unequivocal proof. 2. Some error in feeding is commonly believed in England and America, to bring about the disease, but it is doubtful that feeding plays an important part in the etiology of rickets. Experimentally it cannot be caused by improper feeding. 3. By confining young dogs and depriving them of exercise, rickets has invariably been induced, as in experiments detailed by the writer, that, too, although their diet was beyond suspicion, the air which they breathed pure, and kennels scrupulously clean, while control animals allowed exercise, but otherwise similarly treated, did not become affected. 4. Examination of the conditions under which rachitic children are reared reveals one constant and invariable factor in their lives, namely, confinement. Alike, then, on clinical and experimental grounds, the writer concludes that confinement, with consequent lack of exercise, is the main factor in causing the disease. Possibly a toxin is responsible for the immediate results, but without lack of exercise this toxin will not produce injurious effects.

Digestive Disturbances in Rickets. The digestive disturbances of rickets are divided by A. B. Marfan[2] into those which precede or accompany the appearance of the bony alterations and the dyspepsia of confirmed rickets.

It is often possible in a case of rickets to obtain a history of recurrent attacks of catarrhal gastroenteritis, sometimes dating from the first days of life. Diarrhea is the chief symptom. The stools are frequent, at least five or six times a day, watery, green or mixed yellow, green and white; they often contain mucus. This diarrhea is frequently accompanied by vomiting and there is an odor of butyric acid in the breath. Meteorism and a vesicular erythema of the buttocks are ordinary concomitants.

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(1) British Med. Journal, July 4, 1908.
(2) La Presse Medicale, Nov. 18, 1908,

There is a slight elevation of temperature which never surpasses 38° C. (100.4° F.). Sometimes mild, sometimes more severe, these troubles last a few days, a week, two weeks, rarely more. They then disappear more or less completely for a time but never for very long, when another attack appears, is followed by a third attack, and so on through weeks or perhaps months.

During the evolution of these attacks the weight does not increase but even diminishes and in the severe forms there is a progressive emaciation which leads to marasmus.

At times the dyspepsia preceding the appearance of rachitic deformity is characterized by obstinate vomiting and constipation associated with retraction of the abdomen.

As a rachitic deformity develops, the character of the dyspepsia changes. The appetite is capricious; there are periods of anorexia alternating with periods when the appetite is voracious. The child suffers from flatulence.

The stools of artificially fed rachitic babies are constipated, hard, expelled with difficulty, white, fetid, and rich in phosphate of lime. In breast fed rachitic babies they are sometimes normal, although usually constipated, but not hard. They are yellow and only fetid at times. The abdomen is large and flaccid, as is characteristic of the condition. The large flaccid abdomen is associated with elongation of the intestine due to an atonic condition of the muscular wall. The dyspepsia, then, of a confirmed rachitic child is an atonic dyspepsia and persists until the rachitic process begins to repair.

Rachitic Tooth Erosions and Lamellar Cataract. A case of rachitic erosions of the permanent teeth associated with lamellar cataract is reported by I. A. Abt and M. Frank.[1] It occurred in a twelve year old boy who gave striking evidence of some previous rickets and was very backward at school, due for the most part to a marked visual defect. The ocular examination revealed a bilateral lamellar cataract and erosions of the permanent teeth, considered rachitic in origin. The changes in the permanent teeth showed typical malformation of the enamel, especially of the six-year old molars. The incisors and all the anterior teeth also bore defects in the enamel. The remaining permanent

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(1) Jour. Am. Med. Assoc., Oct. 3, 1908.

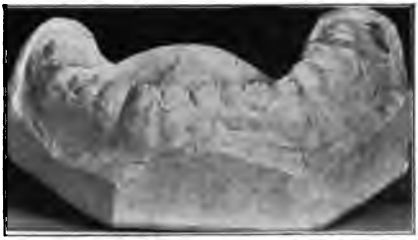

PLATE V.

Showing superimposed tuberosity on molar tooth.

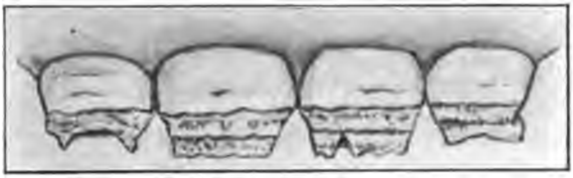

PLATE VI.

Cutting surface flattened and teeth shortened.

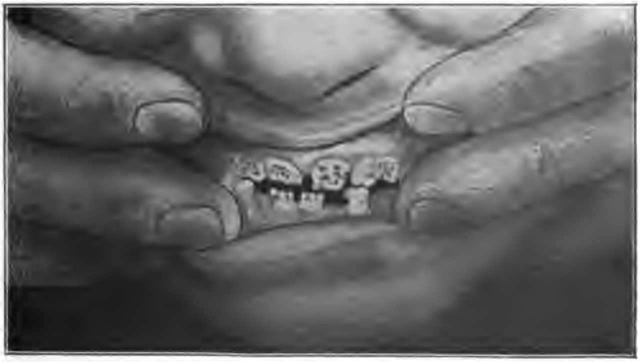

PLATE VII.

Incisors showing rows of punctate depressions.—I. A. Abt and M. Frank. (Page 60.)

teeth, the twelve-year molars and bicuspids (which erupt after the eighth year), presented no traces of malformation but the bicuspids showed a slight defect at the tip.

The writers say the most frequent form of cataract among children is of the lamellar or zonular type. The supposed etiologic relation between rickets and lamellar cataract is well outlined in Fuch's text-book on "Diseases of the Eye." Lamellar cataract almost always affects both eyes, its time of origin falls within the first years of life. It is found above all in those children who have suffered from convulsions. Convulsive seizures at this time of life are nearly always due to rickets and are, furthermore, associated with other rachitic changes, particularly craniotabes.

Erosion of the permanent teeth is a condition marked by a hypoplasia in localized areas. It should be emphasized that this condition has nothing in common with dental caries. These erosions occur with great frequency and are of diagnostic importance. In the mildest form are seen rows of punctuate depressions which surround the crown of the tooth and run parallel to the masticating surface, while the enamel remains for the most part intact. In the severer types instead of the linear depression there is a groove more or less deep involving, as a rule, only the enamel, although it may affect the dentine. These grooves may occur singly or in groups and if in groups, are usually parallel. The single erosions of this kind commonly involve the circumference of the crown, though the condition occurs in other parts, particularly on the incisors. Occasionally are found cup-shaped depressions of various sizes with dark colored bases; at other times facets which appear as though the cutting surface of the tooth had been filed off; only rarely the so-called honey-combed teeth. Another form is characterized by a yellowish or brownish discoloration of the crown and a loss of the normal smoothness or glossiness of the enamel. Very often only the distal part of the tooth is eroded, the proximal portion remaining normal. The appearance of the erosion differs according to the group of teeth involved. On the incisors one notices saw-like indentations or crescentic depressions of the cutting surface. The incisors may be encircled by a groove with yellowish or grayish base. The canines are usually blunt instead of pointed or they may be conical or present V-shaped depressions. In the molars the elevations or tuberosities are lost and the cutting surface is pointed. The cutting or grinding surface of the first molar has a superimposed tuberosity and looks as though a smaller tooth had grown on it. Through constant use these molars in later life become short and flat, as is true also of the incisors.

It is also true that in advanced years the erosions in the distal portion of the incisors wear off and, as a result, the teeth become shorter. They look as though cut or filed off and instead of the sharp angular surface a flat or even surface without enamel is observed. Erosions may involve all the teeth, but the molars, the incisors, the canines and the bicuspids are attacked in the order enumerated.

Summing up the entire matter, it seems justifiable to conclude that when lamellar cataract is associated with erosions of the teeth and with other evidences of rachitic changes or a history of convulsion during infancy, a more or less severe rickets has produced, by perversion in metabolism and probably the production of toxic products, not only the erosions of the teeth, but also the lamellar cataract.

Treatment of Rickets. In a résumé on the treatment of rickets F. Siegert[1] lays stress upon overfeeding, especially giving too much fat, as an important etiologic factor and emphasizes the regulation of the diet in this regard as the chief prophylactic measure. He says high fat percentages and rickets go together. During the first year milk should be partly skimmed and further diluted with decoctions of rice or wheat flour rather than with oatmeal flour which is richer in fat. Children suffering from rickets should be fed carbohydrates earlier than normal children and should never receive more than one quart of milk a day. Meat broths in which cereals have been cooked should be substituted for the milk. After the eighth month potato soup, in which vegetables have been cooked, and raw fruits, especially, if there is a tendency to constipation, can be given.

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(1) Deutsche med. Woch., March 12, 1908.

During the second year the milk should not exceed three-fourths of a quart a day and be taken from a glass or cup. Children who take the bottle up to the third or fourth year in addition to the regular allowance of eggs and meat, obtain two or three times as much proteid and fat as their physiologic needs demand. Small amounts of meat, fresh vegetables and fruits, coarse brown bread rather than white, with marmalade instead of butter should be the chief additions to the dietary during the second year.

Fresh air and sunshine are a great help in the treatment of rickets. Rachitic children should not be too warmly clad. Wide-meshed material is preferred to closely woven for undergarments. Massage and baths, salt or aromatic, are useful to keep the skin in good condition and prevent strophulus, furunculosis and eczema, so often the complication of rickets.

Spasmophilia is the most dangerous complication of rickets. In these cases the intestinal tract should be cleaned out with calomel and castor oil, a starvation diet should be instituted for 24 hours, then a milk free diet for 4 or 5 days (farina and barley water for younger children, vegetable soups and fruit juices for older children). There should be a very gradual return to a milk diet, never exceeding more than about one pint a day. Phosphorus in cod liver oil should be begun immediately, as these remedies are specific in spasmophilia. In rare cases it is necessary to give chloral or bromid to control the spasm. Hemoglobin preparations are helpful, but the writer never uses the calcium salts in florid rickets.

TUBERCULOSIS.

Human Milk from a Tuberculous Source. Mathilde de Biehler[1] has studied the milk of women suffering from pulmonary tuberculosis. In 6 cases of more or less advanced tuberculosis the milk was obtained under antiseptic precautions and injected into guinea-pigs. In every instance the animal gained in weight and gave no manifestation of

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(1) Archives de Medicine des Enfants, July, 1908.

pathologic conditions. At the end of about 6 weeks the pigs were killed and no pathologic changes were discovered.

This experiment proves that not through the milk is the pathogenic agent introduced into the organism of the child but in some other way.

The Instillation of Tuberculin Into the Eye for Diagnostic Purposes. T. H. Butler[1] reports unfortunate results in 3 cases after the instillation of tuberculin into the eyes for diagnostic purposes. In the first, a child of 4 years was suffering from a disease of the ankle and after the instillation of a one per cent. tuberculin solution had a typically tuberculous process set up in the eye with a central nebula, which resulted in considerably reducing the visual acuity

In the second and third cases there followed a severe conjunctivitis which became chronic and resisted all treatment for months. In view of the fact that the instances of this writer are only additions to the fairly long list of casualties consequent upon the instillation of tuberculin he hardly feels justified in using it any longer.

Overcoming the Predisposition to Tuberculosis. Valuable suggestions in overcoming the predisposition to tuberculosis are offered by S. A. Knopf[2]. The mother who fears the transmission of a tuberculous predisposition to her child must throughout the child-bearing period live in the best possible hygienic environment, in the purest air obtainable and, from the earliest recognition of her condition, refrain from the use of constricting garments. She should breathe deeply and often; in fact, she should take regular breathing exercises until the desire for deep breathing becomes natural. The kind of breathing exercises which a pregnant woman can take without any fear, which will really benefit her are the following: She takes a deep inhalation and during this act raises her shoulders, rolls them backward and holds the breath for 3 or 5 seconds while in this position. Then she exhales, moving the shoulders forward and downward. This exercise, which she can take from 3 to 5 times every half hour, she should, of course, practice in pure air, preferably near the open window or when outdoors.

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(1) British Med. Journal, Aug. 8, 1908.
(2) Medical Record, Dec. 5, 1908.

The living and sleeping room of the pregnant woman should always be well ventilated and at least one window kept open in the bed-room even in cold weather.

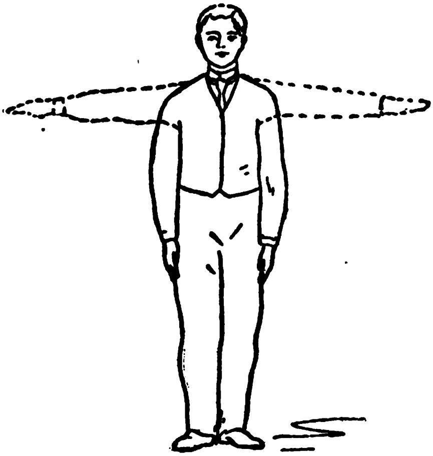

Fig. 1. Exercise A.

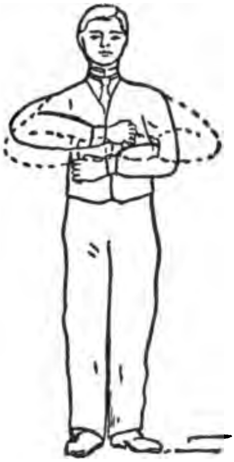

Fig. 2. Exercise B.

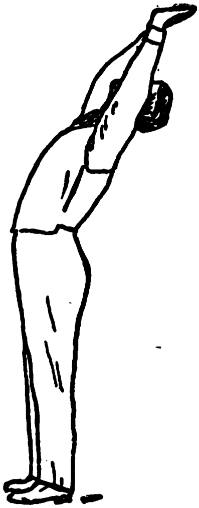

Fig. 3. Exercise C.

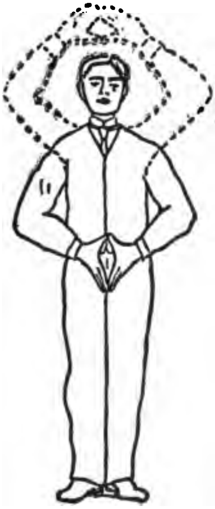

Fig. 4. Exercise D.

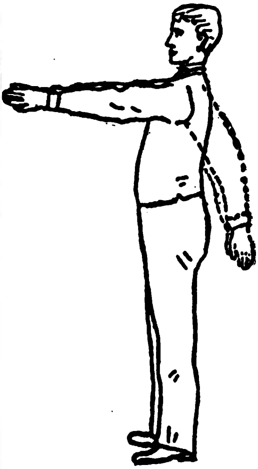

Fig. 5. Exercise E.

The newborn child is as much in need of pure air as the grown person. The lying-in room and the nursery should be well-ventilated and their temperature well regulated. The atmosphere should be warm enough, but never too hot or too dry.

As the young child grows, he should gradually become accustomed to cooler air. The habit of enveloping the child's face in a thick veil when out for an airing is absurd.

Mouth breathing is caused, as a rule, by adenoid vegetations in the throat, sometimes by enlarged tonsils or by polypi in the nose. Besides the deleterious influence on the child's respiratory system, adenoid vegetation may also result in difficulty of hearing, impairment of the intellect and even in actual deformities of the jaw.

So soon as the intelligence of the growing child permits, he should be taught to breathe deeply and later on to take the following breathing exercises: (A) in front of an open window or out of doors, he assumes the position of the military "attention," i. e., heels together, body erect, hands at the sides. With the mouth closed he takes a deep inspiration (that is, breathing in all the air possible), raising the arms to a horizontal position, remains thus holding the air inhaled for from 4 to 5 seconds and then exhales, bringing the arms down to the sides (Fig. 1).

When the first exercise is thoroughly mastered, one may begin with the second. (B) The arms are placed one above the other, in front of the chest, the hands placed as though wanting to tear open the chest. Then hands, arms and shoulders make a backward movement, while one takes a deep inhalation, counting by tapping the chest four times, with both hands, and at the fifth second one starts to exhale, bringing the hands and forearms into the position from which they started (Fig. 2). The advantage of this exercise is that it can be taken in the sitting position, or even when lying on the back.

The third exercise (C) consists in raising the arms from the sides to the horizontal and then above the head, taking a deep inhalation during the act; then bending backward as far as one can and remaining in that position 4 seconds while retaining the air, counting the seconds by moving the hands alternately, twice forward and twice backward. and on the fifth second one exhales gradually while resuming the original position. (Fig. 3).

In exercise (D) one assumes an erect position, as in beginning all exercises, with the hands meeting in front, with the little fingers and the edge of the palms touching the abdominal muscles. While taking a deep inspiration the diaphragm is raised and all attention concentrated on this act, and the joined hands meanwhile moving upward, sliding along the thorax to the chin, then turning and continuing to rise until they are above the head. The trunk is then bent backward during the 4 seconds while the air is retained and during exhalation the arms are lowered gradually to the horizontal and to the original position of "attention" (Fig. 4.)

The fifth breathing or respiratory exercise (E), which may also be called a dry swim, requires more strength and endurance. One takes the usual military position of "attention" and then stretches the arms out as if in the act of swimming, the backs of the hands touching each other. During the inspiration one moves the arms outward until finally they meet behind the back, remains in this position for the usual 4 seconds, counting by moving the hands while retaining the air, and on the fifth exhales, bringing the arms forward again, ready to start for another swim; or if this is the end of the dry swim, the arms return to the original position of "attention." This somewhat difficult exercise can be facilitated and made more effective by rising on the toes during the act of inhalation and descending during the act of exhalation (Fig. 5).

As an additional means of developing the lungs of children, particularly school children, the frequent practice of singing and recitation in the open air cannot be too strongly recommended.

That through proper breathing of outdoor air and good, sensible training, proper and regular feeding a child of tuberculous parentage need never develop tuberculosis must be evident.

In order to give the child the greatest possible opportunity to breathe fresh, pure air, and the best chances for physical development, other things must, of course, be done besides teaching him to breathe properly. The child must have more years of play; he must not attend school before his eighth year. Throughout his child life he should have more hours of sleep than other children and should be kept from all labor.

There should be more playgrounds. Every roof of a tenement house should be transformed into a playground. With the help of good, strong wire fencing and awnings such a roof garden could be utilized the greater part of the year and for children of all ages. Outdoor games and temperate athletic sports should be encouraged not only in colleges, but in children's schools everywhere, and outdoor games and light sports should not be limited to boys, particularly during adolescent life.

After the child has gone through school and even when he has seemingly overcome the predisposition, it is well to bear in mind the possibility of a relapse into such a condition through the unwise choice of profession. A sedentary occupation or profession exposing the individual to the inhalation of vitiated air and much organic and inorganic dust is unsuited for one who is or once was predisposed to tuberculosis.

Pulmonary Tuberculosis in Children. Phthisis is one of the most common diseases of childhood and of those who die of it at the age of greatest mortality (early adult life) the majority acquired the disease in the first fifteen years of life, says Mary Hamilton Williams.[1]

In London in 1905, an analysis of death and postmortem statistics, in comparison with school inspection results, proved that there were approximately 7,000 children suffering from undiagnosed phthisis. Numerous tables of postmortem findings in children all demonstrate the relatively high frequency of phthisis.

The *age of infection* is placed *in infancy* in accord with Behring's belief. The chief source of infection is found in cow's milk, i. e., among artificially fed babies, among whom, also, there is the highest rate of infantile mortality. This tends to carry off the infants infected with tubercle bacilli and thus where there is a high infantile mortality there will be a low phthisis death rate.

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(1) British Med. Journal. Feb. 18, 1909.

Comparing the sexes, statistics show that the phthisis death rate is lower among males between 5 and 15 years and higher in the following years than among females. This is explained by the outdoor life that the boy leads, while his sister is helping in the home, whereas when he reaches adolescence the burden of work falls on his shoulders.

The route of invasion in the vast majority of cases is intestinal, whence the bacilli may pass to the thoracic duct and so to the lungs without leaving a trace in the abdomen. The chief source of infection is cow's milk and this being essentially a child's food is further evidence toward early infection among children.

The early diagnosis is urgent and it is criminal to wait until bacilli are found. Important symptoms are:

Night Sweating.—If it is recent or after months of freedom (i. e., not due to rickets). If it is intermittent and especially when child catches cold. If found especially on forehead and neck. If worse in cold weather and not due to heavy bed-clothes, then in children over 5 years it is mainly due to tuberculosis.

Morning anorexia, fatigue, loss of weight, and fever, which symptoms we will not discuss here.

Auscultatory.—Nothing characteristic, chief reliance being placed on finding an area decidedly unlike the rest.

Other Symptoms.—Susceptibility to colds. Soreness or dull ache, not associated with a pleurisy.

Headaches are frequent.

Tuberculosis in Children. Theo. Sherman[1] presents the results of an investigation of the postmortem records in the cases of children dying from tuberculosis at the Edinburgh Hospital for Sick Children during a period of over 21 years. Out of 1,085 cases, 413 died of tuberculosis, the ages varying from 3 months to 13 years, approximately 68 per cent. being under 5 years of age. The lymphatic glands were tuberculous in 97 of 105 cases, and in 243 of 308 cases. The mediastinal glands were more frequently affected than the abdominal glands, and from the former dissemination took place more frequently. Tuberculosis of the mediastinal glands was usually primary. In nearly

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(1) The Lancet, Jan. 30, 1909.

half the cases of tabes mesenterica there was no ulceration of the intestines, and in one-third of the cases no excavation of the lungs. Primary ulceration of the intestines was frequently found. It was usually accompanied by caseation of lymphatic glands, mediastinal or abdominal, or both, and in a large proportion of the cases the immediate cause of death was tuberculous meningitis. Death was due to tuberculous meningitis in 44.5 per cent. of all the cases. He concludes that statistics vary with the class of patients, the environment and the country in which the investigations are made.

SYPHILIS.

Syphilis Insontium. Knowles[1] describes how syphilis may be innocently acquired in childhood: parturition, circumcision, vaccination, breast-feeding, hand-feeding, fondling, household utensils, toilet articles, unsterilized surgical, dental and electrical appliances, careless and unclean methods in caring for wounds and removal of foreign bodies, and miscellaneous sources. Each of these he discusses in detail and among the miscellaneous sources instances a chancre on the buttock from contact with the mother's vulva (Trousseau); inoculation of a scratch on the forearm of a nine year old girl from mucous patches on the anus of an infant she carried (Dowse); a case of fatal ulcerative syphilis from the use of a conductor's whistle (Taylor); from smoking a discarded cigar stump (Englested); by an infant poking his fingers into other people's mouths and then into his own (Pontet); inoculation by the mother's fingers (Sigmund). He records a case of his own in which the primary sore appeared on the left cheek and escaped recognition until after the appearance of the secondaries. The source of infection was found in the mother, though the primary infection was not obvious and the father was clear. He says, "The mother evidently contracted the disease from some outside, unknown, possibly innocent source."

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(1) N. Y. Medical Journal, July 18, 1908.

DIPHTHERIA.

Circulatory Disturbances in Diphtheria. In discussing the circulatory disturbances in diphtheria J. Howland[1] says that a thorough knowledge of the cardiac lesions which result from diphtheria is requisite for a consideration of the symptoms. Thrombosis, endocarditis and pericarditis occur only occasionally. The two chief lesions are parenchymatous and interstitial degeneration.

Fatty degeneration is frequent. It varies in degree from an extremely mild to a marked change and it constantly accompanies the severe lesions. A much more severe degeneration which affects all parts of the muscle fiber and which leads to the formation of granular detritus and large irregular hyaline masses is also found.

The interstitial changes are of two types. In the first there are focal collections of lymphoid and plasma cells. In the other there is an invasion of the degenerated and necrotic muscle cells with endothelial cells and polymorphonuclear leucocytes.

It is customary to divide the circulatory symptoms into those which occur during the period of local lesions and those which occur during the period of convalescence.

The early circulatory disturbance arising at the height of the disease is extraordinarily fatal when fully developed. There is practically no recovery from this and only a few hours elapse between the beginning of the symptoms and the termination. Before the introduction of antitoxin it was greatly feared, and with reason; now it is rarely met and most frequently among older children or young adults in whom for several days the throat process has been neglected.

The temperature is sometimes greatly elevated, at others little above normal, but the prostration is extreme and there is marked pallor. The heart's action is usually rapid, but the sounds are for a time of fair quality and the blood pressure not much below normal. Before long, however, the pulse becomes weaker, the blood pressure falls rapidly and progressively, the heart's action becomes more and more feeble and the patient quickly passes into a condition of collapse which is unaffected by cardiac drugs. The

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(1) Jour. Am. Med. Assoc., Dec. 19, 1908.

heart, however, continues in many cases to beat after respiration has ceased. Death is due to the action of the toxins on the vasomotor centers.

Caffein, camphor and digitalis hypodermically and frequently repeated, for their effect on the center and adrenalin, for its constricting influence on the blood vessels, are indicated. The last is so evanescent that but little can be hoped from it. Its use is, however, theoretically correct. One or two infusions of salt solution may be given. From antitoxin at this late date nothing can be expected; it should have been used long before and in sufficient quantities.

The late circulatory disturbances may appear at any time from the second to the fifth week or even later. These disturbances are usually met with in older children, and in the majority of instances after severe infections which have gone untreated for a considerable period, but it is astonishing to see after how mild a local infection trouble with the myocardium may arise.

The first symptoms are usually found in the pulse, which drops with the temperature, often to below normal and may remain there for several days before rising again, or it may rise and fall again and repeat this several times. It may remain persistently high. Either of these actions almost certainly means myocarditis.

At other times the first symptom is irregularity in force or rhythm of the pulse. Irregularity in force is much more important than that in rhythm. The rapidity varies greatly and by itself does not give much information. The worst prognosis is indicated by a low and constantly falling rate.

Examination of the heart reveals the same abnormalities as does the pulse, but in addition are found murmurs and evidences of dilatation. As an evidence of myocardial disease of greater value is the alteration in the character of the first sound of the heart. The alteration consists in the more or less complete disappearance of the muscular element in the first sound, the valvular element remaining, or this also may be diminished and even absent. This makes the first sound short, weak and, as it is usually described, "valvular" in quality.

The general symptoms are at times decidedly in evidence. One of the earliest of these is pallor, which is found before there is sufficient anemia to account for its great development. A child whose color one afternoon presents nothing abnormal, on the following day may be blanched to an almost cadaveric pallor. Children may show pronounced mental symptoms, too, apathy, somnolence and indifference, or at times restlessness, excitability and irritability. Gastrointestinal disturbances, especially vomiting, may be present. The vomiting may occur at any time in the course of the disease, may be persistent and when severe always excites concern.

So far as treatment is concerned, there is no doubt that rest and general management accomplish more than drugs. Little permanent effect can be expected from the use of drugs and permanency of effect is what is required, for the myocardial lesions require days and weeks, not hours, for their cure.

Diphtheria Following Tonsillectomy. J. S. Wile[1] reports a case of diphtheria following tonsillectomy, which remained unrecognized for 6 days because there was no culture. It was thought to be a case of simple post-tonsillectomy exudate. In considering this the writer asks the following questions:

Were *B. diphtheriæ* present in the throat at the time of the operation, waiting for the wounded surfaces to afford opportunity for growth?

Was the throat infected at the time of and by the operation?

Was the exudate secondarily infected after operation?

Should a throat culture be made as a routine measure before operations upon the throat?

Should a culture be made as a routine measure from exudates following operations upon tonsils and adenoids?

The last two questions require solution, as the cultures may serve to save life in the future. The case points to the superiority of true diphtheria in postoperative exudates. The value of culture for *B. diphtheriæ* is again emphasized. The clinical history and appearance of the exudate led to an incorrect diagnosis. The culture alone made the cor-

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(1) Archives of Pediatrics, November, 1908.

rect diagnosis of diphtheria following tonsillectomy and adenectomy.

Diphtheritic Paralyses. M. H. Chene[1] describes three forms of diphtheritic paralysis, the localized, the generalized and the cardiopulmonary. He finds the diagnosis usually easy. A child has a membranous angina and the microscope shows the presence of the bacillus of Loeffler. Under the influence of serum the throat symptoms disappear, the temperature returns to normal and the patient is convalescent. Suddenly there arises a difficulty in swallowing, characteristic of paralysis of the soft palate. The paralysis can extend to the muscles of the eyes, next to those of the lower extremities, then to the upper.

When there is known to have been an attack of diphtheria, the diagnosis is clear, but with the symptoms of paralysis and the fact of antecedent diphtheria not established it is not so simple.

Local alterations (syphilis, tumors) of the soft palate may resemble paralysis of this organ. Careful examination, however, eliminates this error.

Paralysis has been reported to have followed nondiphtheritic anginas. The examination of the throat only shows streptococci. But it must not be forgotten that sometimes the diphtheria bacillus disappears very quickly and that often the "anginal paralyses" are diphtheritic after all.

True diphtheritic paralyses must not be confounded with paralysis arising during diphtheria and due to a central lesion like hemorrhage or embolism. These generally are hemiplegic in character.

Infantile paralysis might be confounded with diphtheritic, but the onset is more sudden and febrile; the paralysis is more general and followed by greater trophic disturbances.

The ocular phenomena associated with irregularities of the pulse might suggest tubercular meningitis.

From acute polioencephalitis inferior arise symptoms resembling those of diphtheritic paralysis,—dysphagia, paralysis of the lips, and soft palate. The cardiopulmonary symptoms are similar to those of true diphtheritic

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(1) Gaz. des Hop., Jan. 18, 1908.

paralysis. The question quickly comes up whether diphtheria may not be the determining cause of the polioencephalitis, since this has frequently been observed in the course of infectious diseases or during convalescence from them (scarlet fever, typhoid and diphtheria).

The prognosis of diphtheritic paralysis depends on certain conditions. (1) The extent of the paralysis. Paralysis localized in the soft palate is the most benign and recovers rapidly. The general paralyses on the contrary have a slower course. It is in the course of these that cardiac accidents occur, when the prognosis is graver. (2) The time of appearance of the paralyses has a bearing on the prognosis. Precocious paralyses, appearing the first 3 or 5 days, are the most benign and limited; late paralyses are generalized and grave. Precocious paralyses, however, are not always benign and a guarded prognosis should always be given. It has frequently been observed that an albuminuria is a concomitant of these precocious paralyses.

As to the prognosis of cardiac disturbances, sometimes the only manifestations are slight arrhythmia and rapidity and palpitation; but, when other symptoms appear, the prognosis is very grave. Vomiting and dilatation of the heart are the gravest.

Treatment of Diphtheritic Paralyses. Regarding treatment, early and sufficiently large doses of antitoxin are preventive of diphtheritic paralyses, according to Chene. That statistics show an increase in the number of cases since the introduction of antitoxin is easily explained by the fact that many of those who died before the introduction of serum treatment would have had a paralysis if they had been saved. The interesting question now is whether the serum will cure the paralyses. Hansalter, in 1896, Sevestre and Martin, 1903, believed in its curative power. Schmidt-Rimpler in 1898 obtained a cure in 10 days in 3 cases of diphtheritic paralysis. Ferré has cured with antitoxin experimental diphtheritic paralysis in birds. Other observations have been reported by Mongour, 1900; Dague, 1900; Ballan, 1901; Ginestoux, 1902; Soulé, Sicard, Morquis, 1906. M. Comby, who a number of years ago reported cases, reports (1907) four new ones.

Symptomatic treatment is important in diphtheritic paralysis. If there is trouble in swallowing, solid food must be avoided; cool fluid or semisolid substances are preferable. If swallowing is very difficult, the esophageal tube must be employed.

Regular evacuation of the bowels and bladder must be insisted upon, for there is possibility of these organs becoming paralyzed.

For the cardiorespiratory disturbances, injections of camphorated oil, spartein or caffein and inhalations of oxygen are indicated. Faradization of the pneumogastric nerve may be of service. Baths, massage, and the use of strychnin are helpful in the general treatment.

Kohts[1] advises large doses of diphtheria antitoxin as recommended by Comby for diphtheritic paralyses, but in all severe cases, especially in cases of heart paralysis, he gives strychnin injections as well (3-6 dmg. of strychnin nitrate often repeated). The writer injected as much as 35,000 units of antitoxin and had very favorable results in 10 cases. In 8 cases the paralysis affected the soft palate and, as this always heals spontaneously, the rapidity of the cure was the only evidence of the value of the treatment.

In 2 cases the paralysis was multiple and in one the respiratory muscles were involved. Both patients were cured but received injections of strychnin also.

Urticaria Following Administration of Antitoxin. A. W. Blain[2] reports 7 cases of urticaria following the administration of antitoxin for the second time. In some severe joint symptoms accompanied the eruption. Most of the patients were blonds and the writer is inclined to believe this type more susceptible. He draws the following conclusions:

1. The second immunizing dose of antitoxin should be given with caution, especially to individuals of the blond type, no matter how long before the first dose was administered. Should a person who at some previous time has received antitoxin be exposed to diphtheria, it is better to keep him under observation and to delay the administration until symptoms of diphtheria appear. Diphtheria

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(1) Therap. Monatschefte, July, 1908.
(2) Medical Record, June 6, 1908.

taken early and properly treated is accompanied by as little danger and far less suffering than were some of the cases cited above. Further, in direct exposure to diphtheria, the possibility of contracting the disease is comparatively small.

2. With persons to whom an immunizing dose of antitoxin has been given and who later contract diphtheria, an attempt should be made to gauge the dosage by the severity of the infection, and not to push the serum too far, so overneutralizing the toxin, and possibly producing this distressing condition.

Pyocyanase in the Treatment of Diphtheria. W. Fachenheim[1] reports his experience with pyocyanase as a local remedy in diphtheria. Pyocyanase is obtained from 3 to 4 weeks old cultures of the *Bacillus pyocyaneus* which have been filtered and concentrated in a vacuum to 1/10 their volume. It is a dark brown neutral fluid and is sold in sterile flasks to which an atomizer is attached.

The writer used pyocyanase in 48 cases and concludes that it is a valuable adjuvant in the treatment of diphtheria. It seems to destroy the bacteria and so inhibit the further production of toxins. This causes rapid amelioration of the throat symptoms and disappearance of the bacilli. Pyocyanase should always be used in conjunction with diphtheria antitoxin.

Commenting editorially on this same subject, the *Medical Record,* April 25, 1908, says:

"The gratifying results obtained by von Emmerich in the treatment of diphtheria by means of pyocyanase have been corroborated by several other observers, who state that the local application of the agent to the diseased surfaces is followed by the disappearance of the membrane, diminution in the oral fetor, and improvement in the general condition. It is a difficult question, however, to determine the efficacy of a new remedy in a malady like diphtheria for which a satisfactory mode of treatment already exists, because in all severe cases, of course, serum must in fairness to the patient be used in addition to the pyocyanase. Schlippe administered the latter alone in 6 mild cases, with good results, but in 6 others he was obliged to

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(1) Therap. Monatschefte, August, 1908.

give serum also. Twenty-four other patients received both remedies from the start. Experiments *in vitro* with diphtheritic membrane showed that the pyocyanase was actually lytic for this material, but on the result of his clinical observations Schlippe is not inclined to estimate its therapeutic value very highly. It should not be used except as an adjunct to the serum treatment but it appears to have distinct value where there is excessive membrane formation. In the severe examples of septic diphtheria it is not particularly effective and does not destroy all the diphtheria bacilli in the throat and nasal passages."

The increase of diphtheria in Berlin and the apparently severe character of the epidemic (19 per cent. mortality) gave R. H. Muhsam[1] an opportunity to study the effects of pyocyanase in a comparatively short time. Twenty-three patients were treated with pyocyanase—five with pyocyanase only and eighteen with pyocyanase and serum. All of the first set were cured; of the second four died. The fatal cases were exceptionally severe and two of the patients were brought into the hospital moribund. In three of the deceased tracheotomy was necessary.

The technic of the application is outlined: The patient's tongue was pressed down, then with a spray the liquid was blown vigorously against the tonsils, uvula and the other parts of the mouth, the surplus being expectorated by the patient. The treatment was given three times a day; in the beginning of the disease sometimes still oftener. In nasal diphtheria the preparation was blown into the nose. No injurious effect was observed. The experience with pyocyanase spurs the author to further trials, always in conjunction with the serum treatment.

A Diphtheria Epidemic. J. W. Fisher[2] reports an epidemic lasting from April, 1907, to May, 1908, making 92 cases with clinical symptoms and 95 healthy individuals with Klebs-Loeffler bacilli in their throats out of a total of 4,081 cases examined.

The infection was introduced by visitors to one of the patients, but was spread from within by human and animal carriers, chiefly rats and cats.

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(1) Archives of Pediatrics, November, 1908.
(2) Jour. Am. Med. Assoc., Feb. 6, 1909.

Rigid quarantine was enforced, dormitories fumigated with formaldehyd, isolation practiced, and yet the epidemic lasted 13 months.

Of the 4,081 prophylactic cultures taken, 2.08 per cent. showed diphtheria bacilli. The inadequacy of 2 negative cultures is shown by the fact that in 55 cases the cultures were positive and remained so on an average 23 days after they had been negative for three days.

Diagnosis of smears from swabs using the Neisser stains is time-saving and in most cases confirmed by the cultures.

Conclusions.—1. The chief sources of infections in this epidemic were latent cases (bacilli carriers), rats and cats.

2. One negative throat culture is insufficient for diagnosis.

3. Two and even three successive negative throat and nose cultures do not constitute sufficiently strict quarantine regulations to prevent the spread of diphtheria.

4. In institutions in which large numbers are congregated at least 4 successive negative cultures including 2 nose cultures are imperative.

5. All healthy individuals carrying bacilli in their throats should be isolated during a time of epidemic in institutions unless wholesale immunizations can be undertaken.

6. Bacilli carriers harbored the bacilli longer than did the clinical cases of diphtheria.

7. All hypertrophied tonsils should be treated as a prophylactic measure.

8. Of healthy persons during epidemic 2.08 per cent. were bacilli carriers.

9. When no epidemic existed non-virulent Klebs-Loeffler bacilli were found in 1.1 per cent. of healthy persons.

10. No virulent Klebs-Loeffler bacilli were found in 506 throat cultures 3 months after epidemic.

11. Two weeks is limit of immunization for 1,000 units.

SCARLET FEVER.

The Cause of Scarlet Fever. Gamaleia[1] says that the excitants of scarlatina are to be sought among protozoa and not among bacteria. He has examined 25 scarlet fever

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(1) Berliner klin Woch., Sept. 7 and Oct. 5, 1908.

patients and has succeeded in finding definite protozoa-like structures in the skin, pharynx, blood and internal organs. The typical form of the organism consists of 5 rounded elements grouped about a sixth central body. They are found free in the tissues or included in polynuclear leucocytes and are in no wise similar to products of cell degeneration. In places they are grouped in very regular colonies that resemble those observed among the radiolaria. The forms observed by Mallory are probably stages in the development of the parasite.

Scarlatina Epidemic from Infected Milk Bottles. In discussing scarlatinal epidemic from infected milk bottles, H. B. Wood[1] says that whenever illness appears, particularly if the symptoms are mild or obscure, the physician, besides instituting every protective measure, should instruct that all milk bottles be carefully sterilized or at least entirely filled with boiling water. Every person upon leaving the house should thoroughly cleanse the hands with hot water and soap, especially if any food, candy, fruit, or other store, is to be visited. Since bottles discarded with the ashes are likely to be collected and used for various purposes those from an infected household should be broken. The necessity for such conduct was shown in a recent epidemic of scarlet fever in Collingswood, N. J., where it probably originated in a child seen but once by the physician, who could not positively diagnose anything more than tonsillitis. The epidemic was confined to the customers of a single milkman, was transmitted by infected bottles, and subsided completely and immediately after investigation led the local health officer to sterilize all bottles used by that milk station. During the 3 weeks the epidemic flourished there developed 16 mild and uncomplicated cases in 13 families. Each person infected used raw milk for drinking or on cereals.

Functional Disturbances of Scarlet Fever. J. W. Troitzy[2] found that among 43 cases of scarlet fever there were 33 instances of functional disturbance of the heart, and draws the following conclusions from his study.—

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(1) N. Y. Medical Journal, Dec. 19, 1908.
(2) Arch. f. Kinderheilk., Bd. 45 S. 393.

1. The harmful influence of scarlatinal sepsis or toxins on the circulatory system in general and the heart in particular is often manifested.
2. The functional disturbances of heart and blood vessels are observed in all stages from the first rise of temperature until long after the disease has run its course.
3. The severity of the epidemic and of the disease bears no direct relationship to the severity of the functional heart disturbances.
4. These disturbances are not in themselves dangerous to life; they can, however, decidedly influence the physical and mental development of the child.
5. The most pronounced symptoms are a bruit at the apex of the heart and arrhythmia.
6. The subcutaneous injection of serum produces, although only temporarily, marked changes in the sphymographic curve which indicate severe changes in the circulatory system.
7. Because of the practical scientific interest it is hoped that these disturbances will be studied at greater length.

Gangrene of the Skin in Scarlet Fever. An instance of gangrene of the skin during convalescence from scarlet fever is reported by Huebner.[1] The child had fallen ill December 21, 1907. During the third week she had fever again, difficulty in swallowing and cervical adenitis. Three days later there was pain in the elbows, metacarpal and carpal joints, and an eruption, which appeared first on the right elbow, then on the back of the right hand, then on the inner surfaces of both ankles. The eruption became gangrenous. This lasted 2 weeks, then began to granulate, and after 5 weeks was completely cicatrized.

Heubner was unable to find an analogous case in the literature and believes this trouble was due to a vasomotor disturbance of the skin.

Sudden Death in Scarlet Fever. Sudden death occurs in typhoid, acute articular rheumatism, pneumonia, diphtheria, influenza, erysipelas, etc. Scarlet fever presents many instances of this unexpected disaster.

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(1) Berliner klin. Woch., July 20, 1908.

According to M. A. Gouget and Mlle. Dechaux,[1] death may occur at all periods, viz.: 1. Before the eruption and angina, the so-called malignant type. Exitus in 10 to 12 hours.

2. After 4 or 5 days. Cases are all similar. In a few minutes the body becomes inert, temperature rises, pulse becomes uncountable and death ensues in 24 hours. The following case is illustrative. This case ran a regular course for 3 days. Then, following a bath at 99° F., there was collapse, pulse rapid, pallor, coma and death in 2¼ hours.

3. About the 10th day—less common.

4. During convalescence, sudden vomiting, delirium, restlessness, convulsions, coma, pulse high—exitus. Terrific hemorrhage may appear in the third week and exitus.

5. During a nephritis. Never make a good prognosis.

Postmortem findings: Usually nothing. Occasionally a fatty heart. In case reported here there was careful histologic and bacteriologic search even for anaerobes and no results.

Family Tendency to Relapse in Scarlet Fever. Clifford Beards[2] reports 4 cases of scarlet fever in the same family —two brothers and two sisters. In each of these cases, after desquamation had started, relapse occurred, associated with the usual rash, sore throat, vomiting, etc. In 2 cases, a second desquamation took place. The family history showed no evidences of similar cases. The writer states that in many cases of scarlatinal relapse, the secondary attack is severe if the primary has been mild, and vice versa.

Hydrotherapy in Scarlatina. Full baths in the treatment of scarlet fever are recommended by D. S. Hanson.[3] The method found the most satisfactory is with the water at a temperature of 90° F., each bath lasting from 5 to 10 minutes, with very gentle friction to the body surface while the child is in the bath and the bath to be repeated often enough to control temperature and symptoms. Sometimes

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(1) La Presse Med., Feb. 24, 1909.
(2) The Lancet, Jan. 2, 1909.
(3) Jour. Am. Med. Assoc., Oct. 17, 1908.

it has been necessary to do this as often as every 2 or 4 hours, for 3 or 4 days.

If a bath tub is at hand, the patient may be lowered into it, lying on a sheet with a rubber air pillow placed under the head, although neither is a necessity.

A bath at a temperature of 90° F. is accompanied with and followed by a decided lowering of the temperature of the skin and greatly modifies heat production. In order that the thermogenetic processes may not be interfered with seriously, it is necessary that the body be protected after the bath and not exposed to the atmosphere.

In the toxic type of the disease with high fever, intense rash, great restlessness, often with double rash, rapid respiration and pulse, frequently beginning with convulsions and great mental depression, later often with cold extremities and cyanosis, even cases occur in which toxemia is intense, with little or no elevation of temperature, but with marked depression of the nervous system, manifested by delirium, somnolence, apathy or unconsciousness.

Prophylactic Injections of Dead Streptococci in Scarlet Fever. Of all European countries Russia shows the greatest morbidity as well as mortality so far as scarlet fever is concerned, and it is, perhaps, this fact which has led Russian physicians to special activity in devising methods to fight the frightful epidemics so common in the villages.[1] The results of their efforts have remained for the most part unknown to the American profession as they are published chiefly in the Russian journals, yet they have been striking enough in recent years to merit the attention of the entire medical profession.

Some years ago Gabritchevsky began to use injections of dead streptococci in the treatment and prevention of the disease. The idea was stimulated in his mind by the similarity of the symptoms of the disease in human beings to those of an infectious adenitis of horses caused by streptococcus. Accordingly, Gabritchevsky isolated a streptococcus from the heart blood of children dying of scarlatina and then grew it on the usual artificial media. The first experiments with the dead cultures were made on himself and his children, and after these proved the harmlessness

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(1) Editorial in Medical Record, June 27, 1908.

of the procedure he supplied the vaccines in large quantities to the Russian profession. From that time till April, 1908, 37,000 persons have been treated in accordance with his ideas, over 50,000 injections having been made, for it was soon seen that repeated treatment was much better than a single injection of the dead bacilli. The injection is usually followed by redness, a slight rash and some swelling at the site of the puncture; the regional lymph nodes often swell and are painful; the temperature is slightly elevated; the child becomes irritable, weak and loses appetite; but all these symptoms disappear in a few days. The preventive value of the injections may be judged by some instances quoted in an article by Daniloq in *Russki Vrach,* of May 17, 1908. In two villages where scarlet fever appeared all the children were immediately vaccinated; in the first village no more cases of the disease occurred among children, but two unvaccinated adults were infected; in the second village the vaccinated children remained healthy, but a boy who came from another place on a visit was taken with the fever. Dreyling tells of vaccinating 6 children of a peasant's family, the seventh, a little girl, having hidden to escape the injection. Four days later she developed scarlet fever. Another unvaccinated child was admitted to the hospital with an older sister who was to act as nurse; the older sister had been vaccinated and remained free of the disease though constantly in the scarlatina ward. In another family the older children were vaccinated, but the parents refused to permit the treatment for themselves and for 2 babies; in a few days 3 of the unvaccinated adults came down with the disease; then the youngest children were vaccinated and remained healthy. The general effect of the vaccinations are best seen in the figures of morbidity given by Danilow. Only 1.1 per cent. of all the vaccinated persons were taken sick with scarlet fever; of those vaccinated once 1.21 per cent. were later attacked by the disease, 0.73 per cent. of those vaccinated twice, and 1.09 per cent. of those vaccinated three time being affected. The total mortality from scarlet fever of the vaccinated persons was but 0.123 per cent. The mortality of those who became sick in spite of the prophylactic injections was 11.1 per cent. During the epidemics many, of course, must have been injected while in the incubation period of the disease and in calculating the prophylactic effect of the treatment this must be considered.

These results, obtained in the last 2½ years, deserve attention from all physicians. Since the ravages of diphtheria have been successfully diminished by the antitoxin treatment, scarlet fever has remained the one great disease of childhood, dangerous in itself and bringing with it a host of complications that may kill the child or make him a weakling or invalid for life. Wherever possible Gabritchevsky's method should certainly be tried to determine its value in the treatment and prophylaxis of scarlet fever.

WHOOPING COUGH.

Etiology. C. Fraenkel[1] has attempted to establish the truth regarding the bacillus of Bordet and Gengou as the cause of whooping cough. In 8 or 38 cases he was able to isolate the bacillus from the sputum. In the other 30 he failed, probably because most of the children had been sick 2 or 3 weeks. The bacillus appears in large numbers early in the disease, but is hard to find in the mouth and throat when they become the seat of mixed infection.

Pure cultures (isolated from the 8 cases) were injected into guinea-pigs, rabbits and monkeys. The guinea-pigs and rabbits died in one or two days and showed at autopsy sanguinous exudate in the peritoneal cavity and enlargement of the liver, without, however, proliferation of the bacteria. The peritoneal exudate remained sterile. In the monkeys the results were extremely interesting. Two of the animals were placed in an atmosphere loaded with these bacteria and kept there 15 minutes. After 5 or 6 days they developed a short, spasmodic hoarse cough which lasted 8 or 10 days; no expectoration was noticed.

The uniformity of the findings and the fact that it is a pathogenic organism speaks for the possibility that this is the bacillus. On the other hand, the writer was able to

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(1) Muench. Med. Woch., Aug. 11, 1908.

isolate the same organism from the sputum of 2 children not suffering from whooping cough; and the agglutination experiments gave unreliable results.

Personally the writer believes the organism discovered by Bordet and Gengou is the excitant of pertussis, but urges further experimentation to confirm the findings.

A Study of the Blood in Pertussis. Kolmer,[1] in reviewing the literature on the blood in pertussis, finds that all of the observers since 1897 have found a leucocytosis and on differential count a lymphocytosis, beginning in the catarrhal stage, increasing with the paroxysmal and then decreasing to normal.

During the summer and autumn of 1908 the author had the opportunity of studying 27 cases in the St. Vincent's Home and Maternity Hospital from beginning to end.

Control Cases.—Having a hazy idea concerning the leucocyte count in normal institutional children, he made an exhaustive study of the blood in each of the first five years of life, in children chosen at random, as a control for his pertussis cases. He found that the leucocytes do not change materially with age up to 5 years, the count being lower in artificially fed than breast-fed infants of the same age. He does not consider any count below 12,000 as a leucocytosis. The lymphocytes, both large and small, decrease as the age advances. Basophiles he found quite frequently.

Pertussis Cases.—In the pertussis cases 4 counts were made on each child; one in the catarrhal stage, the second in the paroxysmal stage, the third when the whoop stops, and the fourth 2 months after the paroxysm. His cases demonstrated the following points:

1. In 2 cases examined in the precatarrhal stage there was a slight leucocytosis and an absolutely increased percentage of all forms. The number of leucocytes steadily increased in the catarrhal stage, reached the climax in the paroxysmal stage and then fell by lysis.

2. The lymphocytes followed a similar course, the increase being absolute and not simply relative, as is frequently found in rickets.

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(1) Archives of Internal Med. July 15, 1909.

3. The large lymphocytes ran a more irregular course. In most cases a large percentage was found when the number of small lymphocytes was high and the number usually remained high for a time after the small lymphocytes began to decrease.

4. The transitionals ran an irregular and unimportant course.

5. The percentage of polymorphonuclear neutrophiles was actually increased, but relatively they decreased as the lymphocytes went up. This relationship was changed by secondary complications, as lobar pneumonia.

6. The eosinophiles were normal during the catarrhal stage, relatively decreased during the paroxysmal stage, and in the postparoxysmal stage a mild eosinophilia occurred.

7. The basophiles increased during the catarrhal stage and remained above normal throughout the entire course.

8. Many bilobate and mast cells were found, but no myelocytes.

The following table shows the average counts of the cases in each stage of the disease:

Stage.	Leucocytes.	Lymphocytes,		Transitionals.	Polymorphonuclear.	Eosinophiles.	Mast Cells.
		Small.	Large.				
Precatarrhal (2 cases)	14800	44.01	5.23	1.72	39.57	9.31	0.14
Catarrhal	16800	49.14	9.83	2.03	34.98	3.35	0.53
Paroxysmal	22000	63.19	8.19	1.77	23.92	2.35	0.53
Marked imp'v'm't	16800	38.39	1.06	1.34	45.09	3.71	0.55
Two months after	14000	37.07	11.14	1.19	47.36	2.92	0.54

In bronchitis, laryngitis and other coughs, aside from a slight leucocytosis there is very little change in the blood. Once in a while lymphocytes are slightly increased and in such cases a provisional diagnosis should be made and the child isolated for a few days, when a second examination is made.

The author is convinced that the leucocyte count, especially the differential, will prove of value in the differential diagnosis of whooping cough.

The Leucocyte Count in Whooping Cough. In studying the leucocyte count of normal institutional children and those suffering from pertussis, H. O. Mosenthal[1] drew the following conclusions:

1. The average normal leucocyte count of "institutional" children is (13,850 to 16,391), somewhat higher than that usually given. The normal leucocyte count for these cases varies between extremely wide limits (7,000 to 29,600).

2. The percentages of various kinds of leucocytes in "institutional" children show a slight diminution in the number of polymorphonuclear cells, with a corresponding increase of the mononuclear, as compared with other figures. The percentage of polymorphonuclear cells increases with age in the same ratio as that given for other normal children. The percentage of eosinophile cells is within normal limits.

3. During the catarrhal stage of pertussis an increase is seen in the leucocytes to almost double the normal, and the number of mononuclear cells is increased about 5.5 per cent. at the expense of the polymorphonuclear cells. In the convulsive stage similar, though less marked, changes occur in the blood count.

4. Other cases which have an afebrile cough, but do not develop pertussis, may show a hyperleucocytosis. When this is true there is a marked increase in the number of polymorphonuclear elements at the expense of the mononuclear.

5. A hyperleucocytosis, coupled with an increase in the percentage of mononuclear cells at the expense of the polymorphonuclears, is a distinct aid in the diagnosis of pertussis during the catarrhal stage.

J. F. Crombie[2] analyzed the leucocyte findings in 112 cases of whooping-cough. Twenty-four were observed during the first 2 weeks of the disease; the average age was 3½ years; the average leucocyte count was 20,237 with 32.6 per cent. polymorphonuclear cells and 66 per cent. lymphocytes.

Fourteen cases were observed during the first week of the whoop; the average age was 4½ years; the average leuco-

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(1) Archives of Pediatrics, Nov., 1908.
(2) Edinburgh Med. Journal, Sept. 1908,

cyte count was 22,607 with 32.5 per cent. polymorphonuclear cells and 67 per cent. lymphocytes.

Fifteen cases were observed during the second week of the whoop; the age varied from one year to nine; the average leucocyte count was 22,026 with 31 per cent. polymorphonuclear cells and 67 per cent. lymphocytes.

Eleven cases were observed during the third week of the whoop; the average leucocyte count was 23,255 with 37 per cent. plymorphonuclears and 62 per cent. lymphocytes.

Of seventeen convalescent cases the age varied from 3 months to 9 years; the average leucocyte count was 11,292 with 33 per cent. polymorphonuclear cells and 63 per cent. lymphocytes.

There were 15 cases of whooping-cough that had persisted for over 3 months; the average leucocyte count was 14,886, with 43 per cent. polymorphonuclear cells and 54 per cent. lymphocytes.

Nine cases were undoubted whooping-cough, but never developed the characteristic cough; the average leucocyte count was 13,455 with 42 per cent. polymorphonuclear cells and 56 per cent. lymphocytes.

Four cases were complicated with pneumonia; all proved fatal.

Leucocytosis *per se* is not a reliable means of diagnosis in whooping-cough, but the differential count is an invariable and absolutely accurate one. The lymphocytes are always increased either absolutely or relatively.

It is to this increase of the lymphocytes over the polynuclear cells that the leucocytosis is due and the term *lymphocytosis of whooping-cough* would be more correct than leucocytosis.

As the leucocytosis is due to this increase of lymphocytes, it naturally follows that the increased percentage of lymphocytes has a direct ratio to the severity of the paroxysms, and in the catarrhal stage the higher the percentage of lymphocytes the more likely is the attack to be severe. This increase of lymphocytes occurs in every variety, and for the purpose of diagnosis it is a sheer waste of time to classify them into large, small, etc. In 41 out of 64 cases observed during the first 3 weeks the percentage of lymphocytes was found to be double that of the polymorphonuclears. As the severity of the disease diminishes, so does the percentage of lymphocytes, the latter returning to normal soon after the cessation of the paroxysms, though in chronic cases it may persist for months.

Morphology of the Blood in Pertussis. J. H. Barach[1] made a careful study of the blood in 50 cases of whooping-cough, in which for each case on an average of 8 leucocyte and differential counts were made. He found that at first there is a leucocytosis with increase of all the forms; then a small cell lymphocytosis becomes conspicuous and continues to increase when the other forms have reached their limit. The large lymphocytes follow the course of the small ones, but they reach their greatest numbers after the small cells have reached theirs. During the stage of active lymphocytosis bilobed small lymphocytes are frequently seen as well as numerous degenerated large lymphocytes, especially the basket forms.

Then comes the simultaneous falling of the leucocytosis and lymphocytosis, while the polynuclears begin to resume their normal proportion. A little later the mast cells are observed more frequently and an occasional myelocyte may be seen. While the leucocytosis and lymphocytosis continue to fall, an eosinophilia is noted; this continues for a variable time, after which the blood formula resumes its normal proportions. During this cycle the transitionals seem unaffected.

Clinically, leucocytosis appears about the time the child first coughs; as the coughing goes on, the leucocytosis increases and the lymphocytosis becomes very marked.

Aphasia Following Whooping-Cough. On January 22, 1908, a six year old child suffering from a severe attack of whooping-cough and incipient broncho-pneumonia was seen by J. S. Sewell.[2] Three days later the child suddenly became unconscious and remained so for 3 weeks. Although previously able to talk, during this time he could not utter a word; he suffered also from a paresis of the right upper extremity, most marked in the muscles of the

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(1) Archives of Internal Med., July 15, 1908.
(2) British Med. Journal, July 25, 1908.

hand and forearm. After 3 weeks he regained consciousness and was able to use his arm to some extent, but the aphasia persisted until June, five months after the onset of the disease, when it and the paresis entirely disappeared.

The author believes the condition was due to a hemorrhage in the neighborhood of Broca's convolution and the center for the arm during a paroxysm of coughing.

The Therapy of Whooping-Cough. In discussing the therapy of whooping-cough, Czerny[1] asserts that the symptoms which the nervous system evinces demand more attention than those of the lungs. For the latter no more is required than the usual remedies for nasal, laryngeal and bronchial catarrhs. Czerny emphasizes the necessity of isolation and has often noticed that in the hospital where this is practiced there is slighter tendency to paroxysms. Whooping-cough paroxysms bear this resemblance to hysterical attacks, that one child mimics another. The attendant therefore must never show anxiety or speak of the illness more than is absolutely necessary. Czerny's treatment is based on suggestion which, however, he says is difficult to use with children. Still, a bad tasting drug, like quinin, may have the desired effect; on the other hand it may cause an exaggeration of all the symptoms. Sometimes an entire change in the plan of treatment from internal medication to inhalation or hydrotherapy produces improvement. The therapeutic agent need not be directed toward the respiratory system. The cessation of an attack of whooping-cough after narcosis, surgical-interference or vaccination, is explained according to this theory. Above all, Czerny emphasizes change of air.

The Abdominal Binder. From his experience with the abdominal binder P. B. Cassidy[2] regards it as efficacious in pertussis to abbreviate the course of the disease, check the vomiting, and reduce the number and severity of the attacks. The earlier the binder is applied the better. With infants, especially, the results are wonderful.

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(1) Therap. Monatshefte, Dec. 1908.
(2) Therapeutic Gazette, Sept. 15, 1908.

An Inhalant in Whooping-Cough. Edson[1] advises the following as an inhalant in whooping-cough:

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Creosote	ʒ iii
Eucalyptol	ʒ ii
Spts. chloroform	ʒ vi
Terebene ad..	℥ iii

M. et Sig.—For inhalation. Fifteen drops on a sponge wrung out of hot water.

Treatment with Euquinin. Until a year and a half ago L. Sior[2] employed quinin in the treatment of pertussis with remarkably good results, but on account of the bitter taste, found administering the drug difficult and often impossible. For the past year he has substituted euquinin, finding its effect the same and the administering much easier. In treating 45 out of 84 children he used the drug in the severe cases and give it in sugar, milk or cold chocolate.

The usual dose was a centigram for each month and a decigram for each year, morning and night. The maximum dose was 4 decigrams. In young infants and in those children who could not be persuaded to take the drug by mouth, suppositories of the same dose were found equally effectual. Under the influence of euquinin the attacks became milder, their number diminished, retching and vomiting ceased, cyanosis disappeared and the duration of the disease was considerably shortened. In a few adults the same idiosyncrasies as with quinin were observed. The author considers euquinin a specific for pertussis.

MEASLES.

Complications and Sequelæ. H. R. M. Landis[3] studied the complications and sequelæ in 457 cases of measles.

Eyes.—Next to those of the respiratory system, complications referable to the eyes occurred with the greatest frequency. Marked injection of the conjunctiva, associated with photophobia, was noted in 187 cases (39 per cent.). In 29 (6.3 per cent.) there was a purulent dis-

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(1) N. Y. Med. Journal, Feb. 22, 1908.
(2) Jahrbuch f. Kinderheilkunde, Apr. 4, 1908.
(3) American Medicine, May, 1908.

charge from the eyes, and in 8 of these the eye-lids were edematous and swollen. Marginal blepharitis was noted in 9 (1.9 per cent.) and hordeolum in 3 (.65 per cent.). The only serious sequel noted was corneal ulcer.

Ears.—The occurrence of an otitis media is not unusual and like some of the other complications and sequelæ varies greatly in different epidemics. In this series otitis media was noted in 5 (1.1 per cent.).

Respiratory Tract.—Complications referable to the respiratory tract are of great frequency and few cases escape some aggravation of the phenomena usually present. The importance of the respiratory complications becomes apparent when we consider that in this series 386 patients (84.2 per cent.) had some involvement of the respiratory tract.

Coryza is properly a symptom of the disease and practically invariable. In a small percentage of cases it is purulent; 15 (3.28 per cent.) presented this complication. The lips were swollen and fissured in 13 and in 6 there were superficial excoriations on the upper lip due to an irritating nasal discharge.

Acute congestion of the mucous membrane of the mouth, pharynx, uvula and tonsils is also characteristic of the disease.

In common with the rest of the upper respiratory tract, the larynx is also the almost constant seat of inflammatory changes. In this series 15 (3.26 per cent.) presented symptoms of severe laryngitis; in 2 it was of the pseudomembranous type; both required intubation and both ended fatally.

The trachea may be involved alone or in association with the bronchi; 76 cases (17 per cent.) had a marked cough without any associated pulmonary signs.

Bronchitis, which is commonly classed as a symptom, possesses such power for mischief that its presence must always be viewed with apprehension, particularly among children in institutions. Râles scattered throughout both lungs were noted in 169 cases (37 per cent.).

In every epidemic of measles and in every statistical study of the disease the frequency and the fatality of bronchopneumonia are striking. All the other complications of measles combined do not approach bronchopneumonia as a cause of death.

Heart.—Cardiac complications must be classed among the very rare manifestations of measles. In only 12 cases (2.6 per cent.) was there noted anything abnormal about the heart, and in four of these there was a preexisting lesion.

Kidneys.—In marked contrast to scarlet fever, measles is rarely complicated with a serious kidney lesion. In the present series a urinary examination was made in 178 cases. The urine of 108 (60.7 per cent.) showed no abnormality; in 41 (23 per cent.) there was a trace of albumin; 23 (13 per cent.) showed albumin and casts (hyaline and fatty granular); and 6 (3.3 per cent.) showed the presence of casts alone. There was no instance of a marked acute nephritis.

Vaginitis was noted in 3 cases.

Gastrointestinal Tract.—Redness of the mucous membrane of the mouth is characteristic of the disease and is to be noted in every case. In 14 (3 per cent.) this stomatitis was more than usually severe; in 4 small superficial ulcers were noted on the buccal mucous membrane, and in one there was thrush. Vincent's angina occurred in 5 cases (1.1 per cent.).

Glossitis of a moderate degree was noted in 3 cases, and in one there was an ulcer on the under surface of the tongue.

Ileocolitis constitutes one of the major complications of the disease and is especially likely to occur in weak and poorly nourished children. Ileocolitis was noted in this series in 22 cases (4.9 per cent.); of these 12 recovered and 10 died. In 8 of the fatal cases there was also bronchopneumonia. Nausea and vomiting occurred during the course of the disease in 11 cases (2.4 per cent.).

Noma.—This is one of the worst complications in the course of measles. In this series there were 6 cases (1.3 per cent.). In 5 the mouth alone was affected and in one the groin. In one it was noteworthy that the lesion was bilateral and involved nearly the entire surface. Death occurred in 5 of the cases, bronchopneumonia being the predisposing factor in one.

Adenitis.—Enlargement of the superficial lymphatic glands is commonly noted. In this series marked enlargement of the cervical glands alone was noted in 14 instances; in 26 enlargement of the cervical, axillary, epitrochlear and inguinal glands were noted.

Nervous System.—Although headache and backache are commonly complained of by adults and older children at the onset of the disease, other symptoms referable to the nervous system are not common. In 5 a severe convulsive seizure occurred at the onset and in 4 severe convulsions just before death; in 3 of these cases death was due to bronchopneumonia and in one there was a tuberculous meningitis. Delirium was noted in but 4 cases and in 2 of these there was an associated bronchopneumonia.

Mortality.—Of the 457 patients, 57 died (12 per cent.). The fatal cases, with one exception, occurred in children under 5 years of age. Considering children under 5 years alone, the mortality was 21.5 per cent. The only death in a child over 5 was that of an Italian boy of 17.

Atypical Measles Epidemic in Vienna. In reporting an atypical measles epidemic in Vienna, J. Friedjung[1] asserts that in many families there was immunity to the disease, inasmuch as brothers or sisters did not contract the disease, in spite of the fact that they had never had measles. A similar immunity was noted among nurslings. No case was observed in children under 8 months. In many instances the only evidence of the disease was a transient febrile infection of the mucous membranes. Often the incubation period lasted more than 2 weeks.

A Case of Measles in Utero. N. R. Mason[2] reports a case of measles *in utero.* A primigravida 19 years old, suffering from measles, was admitted to the Boston City Hospital. She made a good convalescence and on the eighth day after entrance was delivered by high forceps. Immediately after the child's birth there was noticed a mottling of the skin over the entire body and a branny desquamation over the chest and in the axillæ. The next day there was desquamation on the forehead and the plantar

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(1) Deutsche med. Woch., 1908, No. 37.
(2) Boston Med. & Surg. Journal, Oct. 1, 1908.

surfaces of the toes and between the toes; the second day more profuse desquamation over the chest and face and sides of the nose; this occurred on the abdomen also. The thirteenth day a fine desquamation could be seen over the temples and in the axillæ. On the twenty-first day it had completely disappeared. Mother and baby were discharged well the twenty-first day after delivery.

The Cutaneous Tuberculin Reaction During Measles. C. v. Pirquet[1] examined 159 children with measles for the cutaneous tuberculin reaction, and concludes that tubercular children lose their ability to react during the eruptive stage. This failure to react may be due to the fact that latent tuberculosis very often becomes acute and spreads rapidly during an attack of measles.

This finding may be of some value in differentiating measles from other exanthemata. However, a negative tuberculin reaction can speak for measles only if in the same individual a positive reaction has already been obtained, or there is present an apparent form of tuberculosis, as scrofula, which will give a positive reaction under other conditions.

RUBELLA.

A Report of an Epidemic of Eighty Cases. M. Michael[2] reports an epidemic of rubella in an institution for children.

Eighty children contracted the disease. In all but 2 the eruption was the first symptom. It appeared first on the face, then spread rapidly over the rest of the body. One description would cover the majority of cases. During the first 24 hours, pale rose-red, slightly raised maculopapules were scattered thickly over the face (forehead, cheeks, chin, behind the ears, around the mouth), the chest and the arms and sparingly over the trunk; rarely were there any on the lower extremities. The lesions were round or irregular, varying in size from a pin-head to a split pea, usually discrete but often confluent on the face.

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(1) Deutsche med. Woch., July 23, 1908.
(2) Archives of Pediatrics, Aug., 1908.

During the second 24 hours the rash was abundant on the lower parts of the body, with confluence of the lesions on the buttocks and in the popliteal spaces. The lesions on the face had almost disappeared, while those on the chest were much paler. As the eruption faded it grew purplish and mottled, especially on the posterior surface of the arms and legs and on the buttocks, where it remained longest. The eruption was frequently found on the palms and soles, and in 17 of the cases was seen also on the mucous membrane of the soft palate, where it consisted of red papules, about a pin-head in size. In some cases the eruption consisted of only a few maculo-papules scattered over the face, trunk and extremities; in others the papules were abundant and formed irregular raised blotches, impossible to distinguish from measles (rubella morbilliforme); in still others the eruption was bright red and confluent over large areas (especially over the abdomen, back and buttocks), while over the rest of the body it bore the usual maculo-papular character. In one case there was a diffuse redness over the entire body (rubella scarlatiniforme).

In some cases the eruption disappeared entirely in 3 days; in others it left the face and trunk in 48 hours, but the mottled appearance on the back of the arms and legs persisted 5 or 6 days. Sometimes the rash seemed to have completely disappeared, but exposure for inspection brought it out again. In 9 cases the eruption lasted 3 days; in 18, four days; in 24, five days; in 22, six days; in 6, seven days; in one, 8 days. A fine, branny desquamation was noted in 35 instances.

Associated Symptoms.—The constitutional symptoms were so mild that it was difficult to keep the children in bed. The temperature ranged from normal to 102.2° F.

Conjunctivitis occurred in 31 cases, but in too mild a degree to cause any discomfort. In 19 cases there was a slight coryza, in 4 a bronchitis. Although there was no complaint of sore throat, a diffuse redness and the eruption on the soft palate were observed in 17 cases.

All children except 3 suffered from glandular enlargement, which appeared in the first day and was the last symptom to disappear. The glands varied from the size of a bean to that of a marble, were hard, and could be rolled beneath the finger. There was never any suppuration. The spleen was palpable in 2 cases, the enlargement disappearing with convalescence.

Leucocyte counts made in 64 cases revealed a leucopenia in 45, a normal count in 15 and a leucocytosis in four. The average count in a leucopenia was 7,700; the lowest count was 5,140.

The urine was examined for albumin and the diazo reaction in 76 cases, but only twice showed the reaction.

Two relapses were recorded and both times the second eruption appeared 15 days after the disappearance of the first.

CHICKEN-POX COMPLICATED BY ERYSIPELAS.

A case of chicken-pox complicated by erysipelas is reported by G. H. Watson.[1] A male child of 5 was taken ill with chicken-pox January 7, 1908. On the second day he began to complain of pain in the groin and kept his leg flexed but showed no sign of inflammation. On the third day an irregular erythematous patch appeared in the groin. It spread rapidly to the abdomen, involving the scrotum, which was swelled to three times its normal size. At the end of 36 hours two large blebs formed in the right groin and the picture was one of a true erysipelas. The temperature rose to 102F., the pulse 130, the child was very restless, a gangrenous area formed on the lower surface of the penis, which sloughed and left a large ulcerated surface. The child was delirious and very ill, but the condition gradually subsided and cure was established 50 days after the onset.

Infection with Vaccine. Eichoff[2] reports the case of a child, not vaccinated because of a general eczema from which he was suffering, being bathed in the same tub with his brother, who had recently been vaccinated, and receiving general infection with the vaccine, most of the eczema

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(1) Post Graduate, 1908.
(2) Deutsche med. Woch., Aug. 20, 1908.

lesions changing into vaccination pustules. The regional glands were markedly swollen and the temperature elevated. In 14 days the disease was over, but numerous scars were left all over the body.

MUMPS.

Hemorrhagic Nephritis Following Parotitis. Jelsky[1] reports the following fatal case of mumps: A boy, aged 7 months, shortly after he had recovered from bronchopneumonia developed an attack of mumps. Three others in the family had previously suffered from the same disease. The process consisted of a marked swelling of the parotid gland on the right side, increased flow of saliva and slight fever. After 9 days the child had sufficiently recovered to be sent to the street on a hot day. Two days later the condition recurred and the skin over the lachrymal region was reddened. The temperature rose to 104°, and the diapers showed a reddish stain, which was found to be due to hemorrrhagic urine. The urine contained blood, albumin and blood casts. The submaxillary gland became affected later and the child died with uremic symptoms. Bacteriologic examinations of the urine and saliva revealed a number of organisms, but none of them proved to be pathogenic in animal experiments. Of the other 3 affected children, the first had the lightest attack, the second was more seriously ill and the third still more so.

J. E. Hunt[2] reports a case of hemorrhagic nephritis in a 5-year-old child who had a mild attack of mumps. Toward the end of the second week the child seemed tired and disinclined to get out of bed. There was slight puffiness about the eyes, very dry skin, and an irregular pulse. The examination of the heart revealed nothing except the marked irregularity of the muscular contractions. Examination of the urine showed a large quantity of albumin, no sugar, and the sediment was filled with large, coarsely granular casts and much blood.

For the next 4 days the total quantity of urine passed in 24 hours averaged 4 oz., very red and "thick." The temperature during this time ranged from 98° to 102°,

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(1) Archiv f. Kinderheil Kunde, 1908, LXVII.
(2) Pediatrics, October, 1908.

the pulse was very irregular; there were no nervous symptoms, simply a marked prostration and tendency to sleep. Stimulation and restricted diet finally began to bring about a slight increase in the urine excreted, but it was not until 10 days had elapsed that anything like a normal quantity was passed. The edema, which at first appeared only about the eyes, gradually extended to the forehead, face, abdominal wall and feet. Recovery was slow.

A Case of Suppurative Parotitis. Suppurative parotitis in a baby 3 months old is reported by P. M. Heath.[1] Three weeks before admission to the hospital the baby became fretful and feverish and had slight convulsions. Squint developed, with head retraction; Cheyne-Stokes' respiration set in and lasted 24 hours. The symptoms gradually subsided, but it is to be noted that 2 days before admission the child developed a swelling below and behind the left ear. The swelling corresponded to the parotid. The skin over it was found to be somewhat edematous but without fluctuation. The head was drawn back and to the left, with marked rigidity of the neck muscles on the left side. There were no signs of intracranial disease, and the temperature was 99.2° F. On pressure over the swelling, a bead of pus appeared at the orifice of Stenson's duct. The pus gave a pure culture of *Staphylococcus pyogenes citreus.* The swelling was fomented and the mouth cleansed. In a week the condition had completely cleared up. The child was breast fed and otherwise healthy and, as there was no disease of the mother's nipple, the source of infection was probably the dirty "comforter" which was used.

INFLUENZA.

Retropharyngeal Abcess in a Girl Aged Eleven. Carpenter[2] relates the case of a girl who, during an epidemic of influenza, was taken ill with fever, sore throat, enlargement of the cervical lymphatics, etc. The tonsils were much swollen and the pharynx slightly inflamed. Three days later the child seemed better and the fever subsided.

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(1) Lancet, August 8, 1908.
(2) Dom. Med. Monthly, May, 1908.

At the end of a week she was well, except for torticollis and snoring at night. There was then discovered a swelling in the posterior wall of the pharynx, which fluctuated. It was incised and recovery rapidly followed. The point is the rarity of the trouble above the fifth year, as in 60 per cent. of the cases it occurs in infants less than a year old.

EPIDEMIC CEREBROSPINAL MENINGITIS AND OTHER VARIETIES.

Hydrocephalus of Meningococcic Origin. J. M. Knox and F. J. Sladen[1] report 2 cases of hydrocephalus of meningococcic origin. The character of the symptoms changes with the onset of hydrocephalus and the clinical picture is frequently not recognized. The first case was that of a child of 5 months, perfectly normal until 2 months of age, when, after general convulsions and a marked gastroenteritis, which lasted 7 weeks, retraction of the head was noticed and the typical pressure symptoms of meningitis found. The fontanelle bulged, the bones of the skull were separated and the sutures gaping. One hundred c. c. of turbid fluid were removed and at the end of a week a second puncture made. The family refused to have the antimeningitis serum tried, and in a few weeks the child died. Autopsy was refused.

The second was a child of 6 months, noticeably emaciated, with retracted head and bulging fontanelles. There was no history to account for the condition. The case did not seem to be one of typical hydrocephalus, and a brain tumor was suspected. Ventricular puncture was performed and a large number of meningococci were found in the fluid. Five ventricular punctures were made. The child finally collapsed and died.

The writers also present a summary of the cases of meningococcus cerebrospinal meningitis treated by an antimeningitis serum (Flexner) in the ward of the Johns Hopkins Hospital during the year ending May, 1908.

During this year 21 cases of meningitis, shown by bac-

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(1) Pediatrics, August, 1908.

teriologic examination of the cerebrospinal fluid to be due to the meningococcus of Weichselbaum, were treated with the serum. Three of the 21 died, making a mortality of 14 per cent. Of 12 patients under the age of 12 years, one died, a mortality of 8 per cent.

The effect first upon the temperature has been to cause a rapid fall. In one child the temperature remained normal after a single injection, but in the majority there was a rise the next day and at least 3 injections required to maintain a normal temperature. As many children recovered by crisis as by lysis.

With the fall in temperature, in 3 to 12 hours the symptoms and signs began to clear. The symptoms,—headache, delirium, pain in the neck and back, and the general hyperesthesia—disappeared with remarkable rapidity. The signs,—strabismus, stiffness of the neck and the Kernig sign—were more persistent. The Kernig was often the last sign to disappear. Strangely, pressure signs and symptoms were relieved by the treatment, notwithstanding the fact that for the spinal fluid removed there was often substituted the same amount of serum, in several instances more serum.

The effect upon the spinal fluid itself was striking. The polymorphonuclear leucocytes were increased in the spinal fluid after the first injection, disappearing as the process healed. The cells in one case were increased from 200 to the c. mm. to 4,000. The influence of this upon the leucocytes in the circulating blood is quite evident. The white cells in the circulation are decreased by the increased demand for them in the spinal fluid. In every case there is a very constant, positive chemotaxis for polymorphonuclear leucocytes in the spinal fluid.

In six cases of tuberculous meningitis the clear fluid with predominating small mononuclear cells changed to a cloudy fluid with polymorphonuclear cells predominating. The increase in cells was observed in a case of influenzal meningitis, but the serum caused no evident change in 2 cases of pneumococcal meningitis.

The meningococci, mainly extracellular at first, become intracellular after serum. As phagocytosis is promoted, it is difficult to find organisms outside of cells in specimens after serum.

The diplococci, besides becoming intracellular, are evidently being destroyed. They no longer stain deeply and distinctly, but are ill-defined and hard to see. This is evidenced by the cultures. The first specimens give an abundant growth. But after serum the same amount of centrifugalized sediment gives from 2 to 10 colonies and many cultures remain sterile after a single injection.

Flexner's Serum in the Treatment of Meningitis S. Flexner and J. Jobling,[1] after an analysis of 400 cases of epidemic meningitis treated with antimeningitis serum, declare their conviction that the antimeningitis serum, when used by the subdural method of injection in suitable doses and at proper intervals, reduces the period of illness, prevents in large measure the chronic lesions and types of the infection, almost always makes the recovery complete, and greatly diminishes the fatalities due to the disease.

C. H. Dunn[2] reports a series of 40 cases treated with Flexner's serum. As this article was extensively quoted from in THE PRACTICAL MEDICINE SERIES, 1908, Vol. X, we will here give only a few of the chief points.

The antiserum was invariably administered by injection into the cerebrospinal canal, according to the technic advised by Flexner. As soon as a suspected case was reported lumbar puncture was made. If the fluid obtained was cloudy, the antiserum was injected at once. If clear, no antiserum was given till the bacteriologic examination showed diplococci.

Cases which showed a marked and permanent improvement after the first dose were not reinjected, otherwise the injections were repeated daily till 4 doses had been given. Resistant or relapsing cases were further injected, according to circumstances. The routine dose was 30 c. c., the maximum 45 c. c., the minimum 10 c. c.

Of the 40 cases, 9 died and 31 recovered. Only 2 of the 31 showed sequelæ. Rigidity of the neck and Kernig's

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(1) Lancet-Clinic, Cincinnati, Sept. 12, 1908.
(2) Jour. Am. Med. Assoc., July 4, 1908.

sign were, under this treatment, among the most persistent signs.

Dunn's conclusions are as follows:

1. The use of the Flexner antiserum is of great value in epidemic cerebrospinal meningitis, comparable with that of diphtheria antitoxin in diphtheria.
2. The use of the serum at times aborts the disease, often rapidly relieves the symptoms, shortens its course, diminishes the likelihood of sequelæ, and greatly reduces mortality.
3. The serum should be used as early as possible in all cases, even of suspected epidemic meningitis.
4. It should be repeated as long as there are symptoms or any tendency to relapse.
5. In late chronic cases the serum is less efficacious, but whenever the diplococci are present there is some hope of relief from its use.
6. Some cases are resistant.

F. S. Churchill[1] had the opportunity of watching the effect of the Flexner antimeningitis serum upon 11 cases of undoubted meningitis—9 of the meningococcic type, 2 undetermined. Four of the children died, the 2 undetermined cases and 2 of the meningococcic type. Seven, then, of the latter variety recovered, all without serious sequelæ.

F. T. Fulton[2] reports 22 cases of cerebrospinal meningitis, with 15 recoveries and 7 deaths. In figuring the mortality of the entire series and eliminating the chronic and moribund cases, the recoveries are 83.33 per cent. The total mortality, including the chronic and moribund cases, is a fraction over 31 per cent. The diagnosis in this series was confirmed in every instance by a bacteriologic examination. Cultures were made from the fluid obtained at the first lumbar puncture in 20 of the 22 cases and diplococci were present in sufficient number to be found in the smear.

Experiences With the Kolle-Wasserman Antimeningococcic Serum. E. Levy[3] reports the result of the Kolle-Wasserman serum (introduced by these investigators in

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(1) Archives of Pediatrics, Oct., 1908.
(2) Boston Med. & Surg. Journal, October 22, 1908.
(3) Deutsche med. Woch., Jan. 23, 1908.

1906) when employed in a small epidemic of cerebrospinal meningitis in the army barracks at Essen. He found the subcutaneous administration of little avail. When injected in large doses into the spinal canal, however, its effects were striking; in 17 cases, where it was so given, but 2 died, a mortality of 11.76 per cent., or, if one moribund case be excluded, only 6.25 per cent. The course of the disease likewise was favorably modified, the fever less marked and the complications less frequent. The average dose the writer places at 20 c. c., which in severe cases should be increased to 30 or 40 c. c., and should be decreased below this amount only for infants. No harmful effects from the serum injections were observed, and, therefore, its general use is strongly urged.

Value of Lumbar Puncture. Twenty-five cases of meningitis since October, 1907, have had lumbar puncture performed, with careful analysis of the fluid obtained and the results have been studied by N. P. Marsh and O. T. Williams.[1]

Meningismus.—Two cases simulating a meningitis were tapped. In one the fluid came out under pressure but was perfectly normal (about 5 lymphocytes to the c. mm.), reduced Fehling's and was clear and sterile. The case proved to be one of periodic vomiting.

In the second case the fluid came under normal pressure and was perfectly normal. The diagnosis finally was made of uremia. The technic is simple, stringent asepsis is most important, and the child is held on its side and not allowed to get up for 24 hours. Large quantities are not withdrawn, and in cerebral tumor cases most caution is used.

Tuberculous Meningitis.—Eight typical cases clinically, all fatal. In several the early diagnosis was due to the lumbar puncture. The fluid here comes away under increased pressure, may often be clear but may show glistening specks in the light, on standing a cobweb coagulum forms in which the bacilli may always be found. Albumin is always increased over the normal .02 to .05 per cent. Fehling's reaction is reduced or absent and the lympho-

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(1) Liverpool Med. Chirurg. Jour. Jan., 1909.

cytes are numerous. Puncture was repeated on sign of increased pressure.

Two cases with identical clinical symptoms with typical fluid findings of tubercle bacilli except that the bacilli were not found in the liquid (the coagulum was not examined) and with a positive Calmette reaction in one, recovered and are well, except for slight paresis in one case and dullness in the other.

Meningococcic Meningitis.—Eight cases of postbasal type. Three recovered, 4 died and 1 was discharged with measles. The fluid in all showed increased pressure, turbidity early, clearing up later. Increased albumin, diminished Fehling reaction. Polynuclear cells, numerous appearance of lymphocytes as the fluid became clearer, and in these cases there was recovery. In all the cases Weichselbaum's intracellular diplococcus. Two cases of cerebrospinal type. One was so mild with so rapid a recovery that diagnosis was made only by typical findings from the puncture, including the intracellular organism.

The second case with typical cultural findings was treated with a vaccine from its own organism, receiving 30,000,000 bacteria every 10 days. The child is convalescent.

Purulent Meningitis.—There were 5 cases, 4 showing pneumonia. Two gave a turbid fluid, with polynuclear cells and intracellular diplococci. Two gave dry puncture and one showed excess fluid on postmortem.

Points of diagnostic interest are:

(a) The unreliability of the intracellular locations for the meningococcus.

(b) The sugar content was never completely absent in the last 35 cases of meningitis, every one has shown at least a slight Fehling reaction.

Diagnostic Value of Lumbar Puncture. Sondern[1] lays stress on the necessity of a complete and careful examination of the cerebrospinal fluid in cases of suspected tuberculous meningitis. After a series of observations in his practice he concludes by tabulating as follows:

Tuberculous Meningitis.—

Pressure—Increased.

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(1) Archives of Pediatrics, June, 1909.

Appearance—Usually transparent and colorless, occasionally slight opalescence.
Density—Not much increased.
Albumin—From ¾ to 2 per mille, by weight.
Coagulation—Slight and frail.
Sediment—Slight.
Cytology—Average number of lymphocytes 86 per cent. (From a study of 14 cases.)
Bacteriology—Tubercle bacilli found in about 88 per cent. of 27 cases.

In the presence of tubercle bacilli, a relative polynuclear cell increase should stimulate a search for organisms of a mixed infection, especially if the sediment is more abundant and coagulation pronounced.

In the absence of tubercle bacilli and other organisms, if relative lymphocyte increase and the other suspicious signs exist in an acute febrile case, the repeated search for bacilli is indicated and the other causes for this combination should be kept in mind, namely meningism of typhoid, pneumonia and infectious diseases.

Abundant sediment, relatively high polynuclear cell count, firm coagulation, decidedly increased density and large amount of albumin indicate a purulent meningitis and the causative organism, pneumococcus, streptococcus or staphylococcus, is invariably found. The differential diagnosis between this class and tuberculous meningitis never offers difficulty.

In the type due to the intracellular diplococcus, the relative polynuclear cell increase is high, usually over 85 per cent., and in the author's cases the organism was found in 96 per cent.

TYPHOID FEVER.

Empyema and Gangrene of the Lung Complicating Typhoid Fever in a Child of Six Years. An unusual complication of typhoid fever is reported by D. J. M. Miller.[1] It occurred in a 7 year old girl admitted to the Children's Hospital on November 13, 1907, the eleventh day of typhoid fever, and presented signs of a moderately severe enteric fever. Examination of the lungs revealed a few

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(1) Archives of Pediatrics, May, 1908.

râles. The patient was not especially prostrated or debilitated. On November 15th some fine râles were noticed over the posterior and lower portion of the left lung; the abdomen was distended, and the child seemed weaker. November 18th flatness was observed over the posterior and lateral portions of the left chest as high as the seventh rib, and the breathing was faintly bronchial. A small quantity of turbid fluid was removed by exploratory puncture; this contained diplococci and streptococci; bouillon cultures showed chains of diplococci, but no typhoid bacilli. The breath now became very offensive and the prostration increased. The temperature also rose, reaching 103° to 104° in the evening, with daily fluctuations of 3° or 4°. By November 21st the axillary flatness had risen to the fifth interspace and extended posteriorly from midscapula to base. Absent voice and fremitus, distant bronchial breathing, egophony and other signs of effusion were present; but three exploratory punctures, at as many different places, failed to discover fluid. The cough now became almost constant and the breath extremely offensive (putrid and fecal-like), but there was no sputum. Diarrhea, prostration and hectic signs were marked. On November 25th an exploratory puncture showed the presence of turbid sanguinolent fluid. Because of the mechanical discomfort this was followed at once by the aspiration, under the influence of ethyl chlorid, of 350 c. c. of an offensive serosanguinolent fluid. Much relief followed and on the next day a rib was resected to establish free drainage. Only a few ounces of fluid were found at operation but the lung was friable and spongy and the odor so horribly offensive that the diagnosis of gangrene was made. The patient survived the operation only three days.

In one of the recognized varieties of pulmonary gangrene the necrotic process begins in a portion of the lung situated beneath the visceral pleura, upon the destruction of which the gangrenous empyema or pyopneumothorax results. The case described comes under this category.

Double Suppurative Parotitis Complicating Typhoid in a Boy Eleven Years Old. H. C. Carpenter[1] reports a case of double suppurative parotitis complicating typhoid

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(1) Jour. Am. Med. Assoc., Dec. 26, 1908.

fever in a boy 11 years old. The typhoid ran a comparatively normal course until the thirteenth day when, in the region of the gall-bladder, there was observed a palpable mass, dull on percussion, which lasted until the seventeenth day, then gradually disappeared.

On the seventeenth day the patient developed a swelling of the left parotid, followed on the nineteenth by that of the right gland. The leucocyte count was 21,800. Both glands suppurated and were freely opened and drained. The pus contained the *Bacillus typhosus* and *Micrococcus pyogenes aureus*. Recovery was complete by the fifty-first day.

RHEUMATISM.

Treatment of Rheumatism in Children. With excellent advice on the treatment of rheumatism in children, J. P. Crozer Griffith[1] says that, although the attacks of rheumatism in children are probably less severe than in adults, yet there is greater tendency to recurrence of some form of the disease, and for this reason prophylaxis is especially important. Particular precautions in rheumatically disposed children or in those with a rheumatic inheritance must be taken against overheating, exposure and fatigue. Not that the child should be kept constantly in a warm room—quite the reverse, the room should be cool rather than too warm. The underclothing should be warm, preferably wool, yet not so warm that slight exercise causes perspiration. Since the child lives near the floor, where draughts are most felt, there is great danger of chill if this precaution is not observed. After free perspiration from active exercise out of doors the child should not be allowed to sit or stand about unprotected. After accidental wetting he should be quickly undressed, rubbed vigorously until dry and warm, and dressed again in dry clothing. Careful, systematic hardening should be sought by use of moderately cool baths, preferably salt water, followed by vigorous friction. In many cases change of climate is of great value, especially during the spring and winter months; dry, warm, equable climates being preferred, since

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(1) Therapeutic Gazette, April 15, 1908.

cold, damp regions distinctly favor the development of the disease. High altitudes, although dry, are not favorable, as the changes from heat to cold are too sudden. The influence of diet is questionable. The eating of meat rather than of starch has been recommended, but the effect has not been proved.

As tonsillitis is often the earliest manifestation of rheumatism, or, according to other views, as it is probable that the germs of rheumatism enter by way of an inflamed tonsil and spread thence to other parts of the body, the necessity of quickly combating lesions of the throat is evident at once.

For the treatment of the attack the patient should be put to bed to rest the affected part. The confinement in bed should continue for at least a week after the disappearance of articular inflammation or other symptoms of the disease. Inflamed joints should be wrapped in cotton and sometimes immobilized by splints. Warm water should replace cold in washing any inflamed portion. Various applications have been advised, among them one of the most trustworthy being ichthyol. Another favorite remedy is oil of gaultheria in full strength or in a 10 or 15 per cent. ointment if irritation of the skin is readily produced. Mesotan and spirosal have been used locally with good results. Gentle compression of inflamed joints by bandaging is often serviceable. The employment of the Bier method of passive congestion is worthy of trial.

In rheumatic endo- or pericarditis the application of an ice-bag is considered serviceable; certainly it often relieves the pain. For the hyperpyrexia which occasionally arises, cool bathing may be needed.

Two methods of treatment are still especially in vogue; first, that by salicylic acid in some form, and second, that by alkalies. Salicylate of soda is well tolerated by children and in comparatively large doses. Sufficient should be given to produce some decided result, perhaps enough to cause a slight deafness and buzzing in the ears, but not pushed beyond this. The salicylates in large amount are contraindicated if nephritis complicates the disease.

Aspirin is useful in many cases, and asaprol has been highly recommended. Salol cannot well supplant the salicylates and should not be given in large doses to children, as it is capable of producing symptoms of carbolic acid intoxication.

It is very important, after the attack of rheumatism appears to be over, to avoid early exposure, lest a relapse occur, and to continue the use of salicylic acid for a considerable time in diminished doses.

Alkalies should be given, alone or in combination with the salicylates, when the urine is decidedly acid, 5 to 15 grains of bicarbonate of soda or of acetate of potash being administered every 3 or 4 hours at from 5 to 10 years of age. Statistics seem to indicate that the alkalies have some power to prevent cardiac involvement. The fruit juices, it is to be remembered, are classed among the alkalies in their therapeutic action.

After convalescence from rheumatism debility and anemia often require prolonged treatment. Cod-liver oil and iron are now useful, and change of air of great value.

For chronic rheumatism perhaps nothing is so serviceable as the hydrotherapeutic measures which may be employed at sulphur and other hot springs, like Aix-les Bains, Teplitz, Wiesbaden, Bath, Hot Springs of Virginia or other hot springs of this country. Constant mild counter-irritants over the joints with iodin is of service. Cod-liver oil, arsenic, iodid of iron and hydriodic acid now find a useful place. Prominent, too, is the application of dry heat, which is often extremely serviceable in subacute cases.

DISEASES OF THE RESPIRATORY SYSTEM.

Congenital Laryngeal Stridor. A. W. Myers[1] reports the following case of congenital laryngeal stridor, because it shows the coexistence of congenital stridor and thymic enlargement, and the disappearance of the stridor with the reduction of the thymus by treatment.

Case of M. B., female, born July 21, 1907. In this case the respiratory rate was very rapid from the time of birth. At the end of a week the inspirations were noticed to be labored and accompanied by a crowing sound. The stridor gradually became more marked, the inspiratory difficulty increased and by the time the baby was 3 or 4 weeks old the bulging forward of the sternum with inspiration appeared. The child was always breast fed. There was no cough and never any cyanosis.

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[1] Archives of Pediatrics, August, 1908.

When the child was seen for the first time, September 13, then about 8 weeks old, she was normally developed and well nourished. On inspection of the chest the labored character of the inspirations was striking. These were accompanied by so marked a recession of the suprasternal notch and the epigastrium that the upper and lower ends of the flexible sternum were drawn close together, producing a remarkable forward bowing of this bone. With this there was an indrawing of the intercostal spaces and a slight depression on each side of the sternum. When she cried or became excited the stridor and labored breathing were more marked. With the child in an adjoining room the crowing sound which accompanied the inspirations was plainly heard. Behind the upper part of the sternum a mass could be easily outlined by percussion. By introducing the tip of the finger deep into the suprasternal notch a mass could be felt indistinctly upon expiration.

The child seemed to prefer lying on her left side and the stridor was increased when she was placed on her back and still further increased when her head was over extended or overflexed. At times, when the stridor was marked, raising her from a lying to a sitting position apparently added to her comfort but did not stop the crowing. These last characteristics only distinguish this kind of case from those in which the larynx is greatly deformed.

A laryngoscopic examination was made and a normal infantile larynx was found.

In July, 1907, Friedlander reported a case of "Status Lymphaticus and Enlargement of the Thymus" in a male infant who at 5 months began to manifest a whistling inspiration and paroxysms of dyspnea with cyanosis. Treatment by *x*-ray exposures was instituted. Within 2 weeks there was distinct improvement and with continuation of the treatment the progress to complete recovery was uninterrupted.

With this encouraging result in mind it seemed advisable to follow a similar course in the case under consideration. *X*-ray exposures were begun on September 14, with a tube of moderate hardness, energized by a static machine. The distance at which the first exposures were made was 12 inches, but later this was reduced to 10 inches. The first exposures were short, only one minute anteriorly and one minute posteriorly. The time was gradually increased and during the latter part of the course the front of the chest was given 10 minutes and the back 5 minutes. Six exposures were given in the first 11 days and as early as this some improvement manifested itself by longer periods of quiet sleep at night and less labored respiration during the day. A rest of 10 days was attempted to ascertain results but at the end of 5 days the mother brought the baby for further *x*-ray treatment, since the trouble had heightened directly upon cessation. From this time the treatment was given as nearly every day as the weather permitted; in all, 47 exposures were used. Nothing more than a transient erythema at the site of exposure was noticed on the skin at any time.

Improvement was gradual but steady. The rest at night became quieter, the crowing less intense, the periods of freedom longer, and the bowing forward of the sternum and the indrawing of the suprasternal notch and epigastrium gradually diminished. The size of the thymus as indicated by the physical signs steadily diminished also.

The latter part of October administration of thyroid extract was instituted, first to prevent any nutritional disturbance which might arise from slight interference with the activity of the thyroid gland, as this could not be entirely protected from the rays, and then to take advantage of the antagonistic effect on the thymus. The improvement continued uninterruptedly and seemed perhaps to be a little accelerated by the thyroid extract, although no definite opinion as to its beneficial influence can be expressed.

The last *x*-ray exposure was made December 11. By this time the area of thymic dullness was reduced to a half inch equilateral triangle behind the manubrium. The dull area posteriorly had long before disappeared. The baby slept quietly all night and breathed quietly most of the day, although she still showed a trace of the inspiratory crow when crying hard or when greatly excited.

Improvement continued after the *x*-ray treatments were discontinued and on February 11, 1908, the following note was made: "Normal baby, no dullness, no bowing of sternum with inspiration, no abnormal sound with inspiration except an occasional little snort. There is a slight indication of tendency to pigeon breast."

In conclusion, the following summary of interesting features may be made:

1. Coexistence of the clinical features of congenital laryngeal stridor with physical signs strongly suggesting enlargement of the thymus gland.
2. Disappearance of these physical signs under *x*-ray treatment.
3. Coincident clearing up of the symptoms of laryngeal stridor.

PNEUMONIA.

Treatment of Pneumonia in Childhood. T. W. Kilmer[1] outlines the treatment he has instituted in his dispensary for pneumonia. The mortality of the series of cases which he cited was 5.77 per cent., which he says is remarkably low compared with that of many private practices or hospitals.

Fresh Air.—The mother is told in as simple a way as possible what she is expected to do to help her baby get well;—that she must place the child in her largest room—in many cases the parlor, with the windows open all the time, with the explanation that her baby is breathing so fast that he requires more air. In good weather many patients are placed, well-covered and with hot-water bottles at their feet, out on the fire-escape for hours at a time during the day; and in the summer time these babies remain out of doors day and night. A flat nursing bottle makes an

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(1) Jour. Am. Med. Assoc., July 25, 1908.

excellent hot-water bottle. No matter what the weather the mother is told that she must bring her baby every day. Many times the patients are brought out in pouring rain and blowing snow storms and the writer is certain that the children owe their lives to these doses of fresh air.

Clothing.—The mother is told that she does her child harm by keeping him bundled with innumerable articles of clothing, especially while the baby is at home. The patient should wear a thin undershirt next his skin and a nightshirt over that. If the baby has no nightshirt, the mother is told to put on a loose-fitting dress. The parents are warned not to place too many or too heavy covers over the baby or to hold him in their arms and add their bodily heat to the temperature of the baby already high. The patient is best in bed.

Food.—In all cases the food is weakened to at least one-half of the usual strength. In the case of a breast-fed baby the mother is instructed to give from ½ oz. to 2 oz. of boiled water just before each nursing. In the case of older children the diet should consist of milk, gruels, cereals and broths. The mothers are told their children must have food at regular intervals, and that there is no cause for worry if the food is not always taken. A young child should have nourishment about every 4 hours. All the fresh-boiled cool water is given that is desired.

Reduction of Fever.—Fever is best controlled by sponging the entire body with tepid water every 4 hours. The baby is placed on a towel on a table, the clothing removed, the sponging done quickly, and the skin wiped dry. Many babies fall asleep immediately after sponging and get a much needed rest.

Counter-irritation.—Mustard poultices to the chest act as a counter-irritant and afford immense relief in the stage of congestion and incipient consolidation. They are made of from one to four parts flour to one part ground mustard, according to the age of the patient, a greater proportion of flour to mustard being used for very young babies. The poultice covers the affected side from spine to sternum, well up under the arm, and should cover the whole lung. It should be applied between layers of linen, muslin or cheesecloth, once in 4 hours and left on for from 10 to 20 minutes at a time, just enough to redden the skin. They should be made fresh each time.

Drugs.—The public is fast becoming educated to the fact that it is not the multiplicity of prescriptions that characterizes the best physician. The one drug, if you can call it such, that played an important part, almost the sole, in this series of cases, is castor oil. An initial dose of castor oil (1 teaspoonful to an infant, 2 teaspoonfuls to an older child) was given each of these patients. If castor oil was vomited repeatedly, then 1 gr. of calomel, in doses of 1/10 gr. every half hour, was substituted. The following method of giving castor oil should be thoroughly explained to every parent.—Wet the spoon before placing oil in it; hold it filled with oil on a piece of ice until thoroughly cold; then give immediately. For older children give oil between two layers of orange juice in a wet glass. Nothing should be given to eat or drink an hour before or an hour after the castor oil. Keep the patient quiet.

Occasionally a dose of castor oil was given every third day to keep the gastrointestinal tract clean. For the accompanying tight distressing cough the following was given all infants:

℞.	gm. or cc.	
Tartar emetic	.00065	
Ipecac	.00065	or aa gr. 1/100
Aqua	3.75	fl ℥i

Sig: One teaspoonful every 2 hours for 6 to 8 doses in 24 hours.

To older children the following was given with excellent results:

℞	gm. or c.c.	
Ammon. Muriate	.13	gr. ii
Ipecac	.0013	gr. 1/50
		or
Elixir simplex	.60	m. x
Aqua	3.75	fl ℥i

Sig: One teaspoonful every 2 hours for 6 to 8 doses in 24 hours.

The two remedies cited above seemed to make the patients more comfortable and were practically the only prescriptions given in this series of cases. Heart stimulants were not used, because none of the patients needed them. Many babies, ill with pneumonia, would recover if the all too-zealous attendants had sense enough to leave them alone. The mother should be told very clearly that it is not necessary continually to "do something" for a patient with pneumonia. If a child falls asleep she should let him sleep. She should try not to bother him oftener than every 2 hours at most; better still, she should let him have 4 hours' repose at a time. She should try to have the sponging, medication, feeding, etc., come all at once, say at 4 hours intervals, and not disturb the patient between times.

F. H. Lamb,[1] outlining the treatment of bronchopneumonia in children, believes that the hygiene is very important. The sick-room should be large, light, cheery and free of all unnecessary furnishings. There should be plenty of pure fresh air in the room, but currents of cold air should never blow directly over the child. The temperature of the room should never be above 70° F. nor much under 60° F.

The clothing should not be too heavy in winter and for infants should consist of a night gown, flannel shirt and flannel binder, preferably with shoulder straps. The bed clothes should be of woolen material but not too heavy. The diet should be reduced in amount. Breast-fed children should be given water before each nursing and held at the breast a shorter time. In bottle-fed children the milk mixture should be reduced in strength one-third to one-half, the volume remaining the same. Children from 2 to 4 years of age should receive a diet of diluted milk, gruel and broths. The bowels should move at least once a day.

The position should be changed frequently and it is a good plan to allow the child to lie on his stomach a part of each day in order better to ventilate the posterior part of the lower lobes.

The bronchitis, which usually accompanies the onset, should not be treated by emetics or expectorants in syrupy mixtures; they do little good and upset the digestion already weakened. Counter-irritation of the skin over the thorax may bring great relief, but the irritation must be severe enough to produce a distinct redness of the skin. Turpentine or camphor dissolved in oil or lard may be effective in mild cases, but mustard is better in severe ones.

When the onset is accomplished with high fever, rapid

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(1) Lancet-Clinic, Jan. 4, 1908.

breathing, cold extremities, convulsions, stupor or coma, the mustard bath, or better the mustard pack, should be used. For the mustard pack ½ pound of mustard is mixed with 3 pints of warm water in a pail or pan and allowed to stand until the oil of the mustard is set free and gives the characteristic penetrating odor. A sheet is wet in this solution and thoroughly wrung out. The child is placed on a blanket and then enveloped in this sheet from the neck to the toes and the blanket wound over all. Cloths should be placed about the neck to keep the irritating odor from the eyes, nose and lungs. The pack is continued until the skin is a flaming red, then removed and the child thoroughly washed in a warm bath to remove all the mustard. If the cerebral symptoms still persist, cold water should be poured on the head and back of the neck while the child is enveloped in this warm bath. The child is then enveloped in a moist sheet and wrapped up in the blanket for a half hour or an hour. At the end of this time the blanket is removed and the child sponged with tepid water and well dried. This may be repeated once or twice on each of the first few days.

In many cases the coal-tar antipyretics are to be avoided if possible. If the temperature is not very high and if it responds readily, sponging with tepid water containing alcohol or salt is all that is necessary. It should always be done under a blanket and the skin thoroughly dried afterward. The writer's favorite method of reducing the temperature is the cold compress to the chest. It not only reduces the temperature, but has a beneficial effect upon the lung itself. A white cotton or linen cloth folded into 3 or 4 thicknesses, long enough to encircle the entire chest and broad enough to reach from the top of the chest to the umbilicus, is wrung out of water at room temperature —60° to 70° F.—and wrapped around the body. This is covered with a flannel binder and changed every 3 hours.

When the cough is painful or prevents the proper rest, it should be relieved by opiates. Codein, 1/40 gr. at 6 months, 1/20 gr. at 1 year, 1/10 gr. at 3 years and ⅛ gr. at 5 years, every 2 or 3 hours, is very well borne by children. It is excellent not only for cough, but for pain as well. Dover's powder or heroin may also be used.

Many physicians do not wait for signs of circulatory embarrassment to appear but begin a supportive treatment for the heart as soon as they diagnose pneumonia. The administration of small doses of strychnin, 1/200 to 1/300 grain every 3 hours from the onset, does not disturb the digestion and may carry a weak heart through without any signs of failure.

Digitalis does not act so well in children as in adults, and must not be used indiscriminately in cardiac embarrassment. It should never be given where there is high blood pressure or weak stomach. The initial dose should be large, 15 to 25 drops of the tincture to a child a year old, repeated once or twice, then 2 to 5 drops every 2 hours until the pulse drops to 105 or 110. Strophanthus is a much safer and better drug than digitalis, if a reliable preparation can be obtained. At one year, 2 to 5 drops of the tincture in water or milk every 2 or 3 hours for the first 2 days, then decreased if necessary.

Caffein is another excellent drug for a weak heart when cerebral congestion is not marked. It may be given in ½ gr. doses every 2 hours to a child of one year in the form of citrate of sodio-benzoate.

Camphor as a heart stimulant is not appreciated by most physicians. A child of one year may take one drachm of aqua camphoræ every 2 hours. Nitroglycerin is indicated when there is high arterial tension or when there is marked cyanosis with cold extremities. As soon as its physiologic effect is obtained, it should be discontinued.

In case of collapse from heart failure a hypodermic of ether should be given. This is the most powerful and most quickly acting heart stimulant known, but its effect is fleeting. It should be immediately followed by a hypodermic of strychnin sulphate, 1/30 to 1/50 of a gr. to a child of a year, or with a syringeful of sterile camphorated oil. The oil is absorbed slowly and the constant stimulation of the camphor is carried over long periods. The child should be put in a hot mustard pack or bath. If there is a reaction in the pack, there is still some hope, but if not the prognosis is almost invariably fatal. If there is great dilatation of the heart, a hypodermic of tincture of digitalis, 10 to 15 drops, should be given and repeated in an hour. Strychnin, digitalis, camphor and caffein should be administered hypodermically to the limit of their tolerance until the danger is over; then they should be gradually decreased. In the time of collapse, alcohol in the form of brandy or whiskey should be given by stomach in large doses. This is the period when it is most useful.

During convalescence careful diet, careful hygiene and careful nursing are essential; stimulants should be given only when necessary and then strychnin. If the convalescence is protracted and slow, tonic doses of iron, arsenic, strychnin and quinin should be given. Cod-liver oil is also valuable. A change to a warm, dry climate will often be beneficial.

Hemoptysis in Children. R. Saint-Phillippe[1] says that with the exception of those which occur among the newborn, hemorrhages are rare among children. Whooping-cough is most often the cause of hemoptysis and in this disease epistaxis must not be mistaken for hemoptysis. The most frequent causes of this complication of whooping-cough are congestion of the lungs and bronchopneumonia, simple or tubercular.

The next commonest cause of hemoptysis is the presence of a foreign body in the respiratory passages. The writer cites the instance of a five-year-old child who swallowed a blade of wheat. The first indication of trouble was a severe hemoptysis, which recurred again and again. Finally fever and evidences of bronchopneumonia developed. The child died, and at autopsy in the end of the left bronchus was found a blade of wheat surrounded by an area of pulmonary gangrene.

In little girls hemoptysis may be a manifestation of precocious menstruation. The attacks are periodic, last only a few days and do not affect the general health. They usually accompany a sanguinous discharge from the vagina.

Hemoptysis is exceptional in tuberculosis among children. It occasionally occurs in influenza, which is then mistaken for tuberculosis.

It is the view of the writer, however, that, whenever

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(1) Jour. de Med. de Bordeaux, Oct. 25, 1908,

there is a spitting of blood, a careful examination should be made of the posterior nares for adenoids and of the mouth for dental caries or ulceration of the frenum of the tongue.

Fatal Hemoptysis in a Child. The following fatal case of hemoptysis in a three-year-old child is reported by W. E. Magruder:[1]

A negro boy, aged three, was admitted to the hospital May 9, 1905, and died from pulmonary hemorrhage on the forty-fourth day. When he entered, the examination revealed consolidated areas in the upper part of the left lung, tubular breathing, fine crepitations over the left side, front and back, and a friction rub over the base. The percussion note over the sternum was dull and suggested glandular enlargement and glands in the abdomen and neck could be plainly felt. The liver was much enlarged. The spleen could not be felt. The child was emaciated and greatly suffering from dyspnea. The nurse succeeded in wiping some sputum from his mouth after a spell of coughing, but tubercle bacilli were not found. The temperature on admission was 102° F. and ranged between 101° and 104° F., except on the twenty-ninth day, when it became subnormal and the child appeared to be in collapse; he recovered after active stimulation. No special examination was made of the stools at this time for evidence of blood and a small pulmonary hemorrhage may have taken place.

The disease progressed rapidly until the forty-fourth day, when death followed a profuse hemorrhage, during which blood poured from the mouth and nose.

At autopsy the following notes were made: There was general glandular enlargement. The left lung was consolidated at the apex with emphysematous areas throughout and was completely studded with tuberculous nodules. The right lung showed pleuritic adhesions and fluid was present in considerable quantity. In the upper lobe was found a cavity into which a branch of the pulmonary artery had ruptured, causing hemorrhage and death. The stomach contained much blood. The liver was fatty and

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(1) **Archives of Pediatrics, July, 1908.**

showed miliary tubercles in abundance. All the organs were full of tuberculosis nodules, as were also the peritoneum and mesentery.

Fibroid Phthisis in Childhood. A. W. Fairbanks[1] says that the term tubercular interstitial pneumonia is preferred as describing accurately the process in general and the cause in certain cases.

The essential pathologic feature is a proliferation of interstitial tissue, either interalveolar or interlobular, which involves an entire lobe or lung. The process seems to be secondary to the pneumonias, bronchitides and old pleurisies, but why it sets in so seldom is unknown, the present hypothesis being that there is an individual predisposition to excessive interstitial connective tissue formation.

The further pathology follows the contraction of the connective tissue; diminished lung space and restricted motility, retraction of the chest wall with scoliosis, right heart hypertrophy and occasional attacks of dilatation with its secondary findings, displacement of the heart toward the diseased side; if this is the left, there will be more heart area uncovered and so more dullness; if this is the right the heart will be covered by the compensating left lung hypertrophy and there will be less dullness. Liver and spleen may be displaced downward.

All these symptoms were seen in a case. The patient had pneumonia at 2 years with a persistent cough ever since; a year later a phthisis case died in the same house. Patient seen at 4 years when a diagnosis of left pleurisy had been made—though there was diminished resonance throughout. The needle failed and my diagnosis was accepted. Patient had no consolidation and no sputum. Did well for 2 years except for slight bronchitis attacks. Then had a severe bronchopneumonia consolidation of left upper lobe and tubercle bacilli in the sputum. The bacilli disappeared in a few days and the consolidation in a few weeks.

Recovery was good. Cough has ceased and the physical signs in past 3 years have cleared up considerably. Prognosis is not unfavorable.

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(1) Boston Med. and Surg. Jour., Feb. 18, 1909.

Features of Some Chronic Affections of the Lungs in Children. Theodore Fisher[1] presents cases and specimens of dilated bronchial tubes in children. He emphasizes the fact that the physical signs in this condition may closely resemble the signs of cavitation or fibrosis of the lung, due to tuberculosis, especially if the dilated bronchial tubes are limited to one lobe. For this reason, in making a prognosis, care must be exercised lest too serious an opinion be given.

DISEASES OF THE GASTROINTESTINAL TRACT.

Noma. R. C. Rosenberger[2] has made a bacteriologic study of seven cases of noma, one following typhoid fever and six following measles. Spreads were made from all the patients during life and after death and as the bacterial flora observed in all was similar, a general description will suffice. Foremost and most abundant was the spirillum and fusiform bacillus of Vincent; next in frequency were diphtheria-like organisms, streptococci, staphylococci, and, in one or two instances, pneumococci.

From this study the writer deduces that the affection known as noma is due to a number of bacteria, chief among which are the symbiotic organisms of Vincent. The reasons advanced for this supposition are that the first evidence of the disease is a membranous or ulcerative process; that in this stage the fusiform bacillus and the spirillum of Vincent are present in great numbers; later, as the process goes on to gangrene, other organisms, like the diphtheria-like organism, streptococci, etc., make their appearance, and from the latter invasion toxemia develops and the disease proceeds to a fatal termination.

A. Pawlowsky[3] reports two cases of noma, one after dysentery ocurring in a little girl of 5 years and one in a boy of 3 years. The chief interest lies in the bacteriologic examination of the gangrenous areas. In the upper parts a bacillus was found with a few diplococci; in the deeper parts a streptothrix. The writer

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(1) Lancet, Jan. 2, 1909.
(2) N. Y. Medical Journal, Feb. 1, 1908.
(3) Archiv f. Kinderheilk., Bd. LVIII, p. 318.

thinks this streptothrix is analogous to that already described by Perthes and is the pathogenic agent of noma.

Ulcerative Stomatitis. In discussing ulcerative stomatitis, M. H. Greene[1] lays stress on the contagious character of the disease. It is never acquired from contact with another type of stomatitis, but always from the ulcerative form. This he considers an important argument for the specific nature of the disease. On the other hand, the disease shows a similarity to Vincent's angina, and often one member of a family suffers from ulcerative stomatitis and another from Vincent's angina.

Cardiospasm as a Cause of Habitual Vomiting in Nursings. F. Goppert[2] believes that there can exist a cardiospasm analogous to pylorospasm and that this may be a cause of habitual vomiting in infants. In these cases the spasm prevents the onward passage of food and leads to severe emaciation. The author cites a case in which emaciation was prevented by feeding through a tube and recovery occurred spontaneously.

Obstinate Vomiting. W. P. Northrup[3] reports a case of persistent vomiting in a healthy three-months-old baby. The infant was able to retain various foods from other sources and his mother's milk when given it in a bottle with a rubber nipple; whenever he nursed naturally, however, he promptly vomited the whole intake.

Northrup found that when the child was so placed that his head was lower than his body he would stop nursing as soon as he had satisfied his hunger. Then the vomiting ceased.

Curative Effect of Rest in Children with Persistent Loss of Appetite. A group of symptoms occasionally seen in children and which are benefited by rest and by no other treatment are described by I. M. Snow.[4] They are:

1. Chronic Loss of Appetite.—Patient under weight; indifferent to food.

2. Extreme Weakness.—Inability to run, walk or play;

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(1) Gaz. des Hop., March 30, 1909.
(2) Therap. Monatshefte, August. 1908.
(3) Medical Record, Nov. 21, 1908.
(4) Jour. Am. Med. Assoc., Dec. 5, 1908.

patient collapsed with fatigue at frequent intervals during the day.

3. Nervous Disturbances.—Deficient, restless sleep; lack of concentration at study. Some patients emotional and irritable; others apathetic. Children fidgety in manner, illustrating the pathologic law that deficient capacity for functional activity is associated with undue readiness for slight actions.

The condition under discussion is to be clearly distinguished from anorexia nervosa. Anorexia nervosa is a type of hysteria causing rapid loss of weight without organic lesions; but this trouble is a persistent loss of appetite or indifference to food, from nervous or muscular exhaustion, with no cerebral disturbance. The patient may be emotional, petulant, naughty, but there are no delusions, no hysteria.

The writer adopts the plan of putting the boy or girl to bed and keeping him there for 2 weeks. In winter the patient, well wrapped up, may be given an airing with the windows open. In the summer he may be put in a hammock or may lie on a lounge out of doors. A younger child may be placed in a perambulator, but no driving or automobiling, which excite and tire the patient and may offset the good of the enforced confinement. The body should be sponged off and well rubbed, morning and evening, as a matter of toilet, and also to relieve the restlessness. A suitable, nutritious diet, well cooked, varied and attractive, with no especial restrictions, should be served. The child's attendant may amuse him with games and toys or read diverting stories, but may never scold or irritate him. Tonics may, of course, be given, but they are accessory, not essential elements of treatment.

After a few days in bed, the effects of rest will be evident in the appetite. The child will show a keen and critical interest in his meals, consuming enormous portions. The food is perfectly digested. As the constipation previously observed was due to underfeeding and lack of muscular tone, no laxative is now necessary. Sleep will come quickly in the evening—quiet, continuous, refreshing.

Rest should be continued until there is a considerable gain in weight and a good appetite and natural sleep for 10 or 12 days. There will now be a return of muscular vigor with repose of manner, to be contrasted with the jerky, twitchy actions before the treatment.

An average period for complete inactivity is two weeks. When the nutrition, strength and appetite are satisfactory, the child may be dressed and given an hour of perfect freedom, out of doors if preferred. With continued improvement the period of activity may be increased one hour every 3 or 4 days, until the child has 6 hours' perfect freedom in the middle of the day, out of doors for a part of the time. If the child is still delicate or his health not quite normal, the short day should be continued for several months. At this phase in the treatment nutrition is much stimulated by a change of air, as to the country or seashore, if the patient is properly restrained from violent athletics and trials of strength. It will now be found that the powers of endurance of both muscular and nervous system are permanently augmented, that there is natural sleep, a steady increase in weight and a ravenous appetite, with perfect digestion.

After from 2 to 4 months, restraint is no longer necessary and the child may lead a normal life. Recurrence of the anorexia is unlikely.

Studies in Infantile Digestion. A. Friedlander[1] made a systematic trial of Einhorn's bead test in children to determine its value as a working method.

Einhorn's method may be stated briefly as follows: Small pieces of various food stuffs are fastened to small glass beads by a silk thread. The beads are strung together by an additional thread and the string put into small gelatin capsules. These capsules are swallowed by the patient and the string of beads is then later recovered from the stool. The exact time required for the passage of the beads through the gastrointestinal canal must be noted in each instance. If the beads remain in the tract over 50 hours, the results are not considered reliable, because of the degeneration due to the action of the intestinal bacteria.

Einhorn has recommended the following test substances:

Mutton fat, for fat digestion. Beads are dropped into melted mutton fat, which is then allowed to cool and so coat the beads.

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(1) Jour. Am. Med. Assoc., Dec. 19, 1908.

Beef, for proteid digestion. Small strands of raw fresh beef in alcohol are tied to the beads.

Potato, for starch digestion. Potatoes boiled for 2 minutes are cut into small pieces and not peeled; these pieces are sewed to the beads.

Catgut, for fibrin digestion. Small strands of raw catgut are tied to the beads.

Nuclear digestion, small pieces of sweetbread.

The author pursued two lines of experiments. Older children able to swallow capsules were given them prepared according to Einhorn's method except that all the foodstuffs were enclosed in small bags of wide meshed gauze to avoid being torn from the bead. It was found feasible to insert 5 small bags containing mutton fat, catgut, potato, beef and sweetbread, each attached to a bead of especial color (for purposes of identification) into a five-grain capsule, which the older children had no difficulty in swallowing.

For very young children and infants the scheme devised was by means of a small rubber catheter to introduce into the infant's stomach singly the foodstuffs, each attached to a separate bead, each placed in a separate bag. The bead was inserted into the end of the previously sterilized piece of catheter; the catheter was pushed past the constrictors of the pharynx, as in the introduction of a stomach tube, and then by means of a stilet passed through the catheter, the bead was pushed out of the catheter and into the esophagus. This method was found surprisingly easy, even with infants only a week old.

In the first of the capsule series it turned out that in only one child, a boy of eleven, was there complete digestion of all the foodstuffs. The sweetbread invariably was digested; the mutton fat was digested in 21 out of 25 cases; the catgut was digested 17 times, the raw beef 14 times, and the potato only 8 times. In both the raw beef and potato series partial digestion was quite often noted. According to these results, then, the foods follow this order of digestibility: sweetbread, mutton fat, catgut, raw beef, potato.

The average time required for the passage of the capsule in 25 experiments was 22⅓ hours, with 32 and 17 hours as the extremes on either side.

The summary of the second series follows: With raw beef there were 41 experiments. Of the 25 children over one year, 14 showed complete digestion, 5 partial. In children under one year there were 13 experiments, with 5 complete and two partial digestions. In 2 children, aged 5 months, there was complete digestion.

Milk Curd: Twelve experiments in children from 5 weeks to 12 months with complete digestion in every case.

Egg White: Five experiments among children from 10 weeks to 3 years with complete digestion in every case.

Egg Yolk: Experiments in 3 children, 10 weeks, 9 months and 13 months respectively, with complete digestion in every case.

Catgut: Thirty experiments with children from 5 months to 12 years; 27 showed complete digestion; 3 none. Two of these last had at different times digested catgut. It is noteworthy that catgut was digested completely on 2 occasions by a child of 5 weeks.

Sweetbread: The sweetbread experiments numbered 28. Twenty showed complete digestion, 6 partial and 2 no digestion. Even on the 2 occasions when the sweetbread substance was not digested, the nuclei were completely digested. To test nuclear digestion, in other words, to study the activity of trypsin at a very early period of life, a special series of sweetbread experiments was undertaken in very young children. In this series 13 children from 5 months to 8 days were tried. Microscopic smears were made after the sweetbread beads had passed. The bags were washed, then opened, smears made from the residue, and the smears stained with methylene blue. In none were any nuclei found, even when there had been some sweetbread residue. Since it is now settled that nuclear digestion is the result of pancreatic activity only (trypsin), it seems proved that the pancreas must be functionally active from birth. It is of special interest that in a child 8 days old there should have been complete digestion of the sweetbread.

Potato: The series included 27 experiments among children, all under 16 months except three. There was complete digestion 5 times, partial 6 times and no digestion in 16. This comparative inability to digest starches was, of course, expected and accorded with the potato experiments in the older children.

The writer believes that the method promises to be valuable in the study of the digestive processes of early childhood and infancy.

Winter Diarrheas in Infants. E. K. Shelmerdine[1] attributes winter diarrhea in infants to the use of frozen milk. When milk is frozen the water in it is congealed into ice, the perfect solution of the casein in water is disturbed, and there results clumping of the proteid molecules, which lose their solubility; on the reduction of the frozen mass to liquid, the curds, through a chemical change brought about by the freezing, are incapable of acquiring the solubility which they formerly possessed. These minute curds cannot be broken up by pouring milk from one jar into another, by agitation or by heating, and are present in the final mixture.

Certified milk, as a rule, contains very few bacteria when compared with ordinary milk; yet it has some, enough under favorable conditions to multiply into immense numbers. These clumps of casein carry with them the majority of the bacteria suspended in the milk. In the gastrointestinal canal of the child they are difficult to digest and are not broken down by the digestive juices into assimilable forms, since the rennet in the child's stomach is not capable of bringing about the molecular changes necessary for the proteolytic action of the gastric and pancreatic juices. In other words, tough curds, difficult to digest, are ingested. These curds undergo decomposition in the intestines and are excellent foci for the multiplication of the bacteria with which they are loaded, as well as for the microorganisms always present in the intestinal tract.

The diarrhea caused by frozen milk is neither so severe nor so debilitating as that of the summer season; nor is the number of the stools so great. Six to 12 stools a day is the average. The stools are green, acid, watery and contain small cheesy masses of undigested casein; the buttocks are generally excoriated from the irritative effects of the acid stools. The colic is distressing.

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(1) N. Y. Medical Jour., March 14, 1908.

The child should be taken off the milk diet for 24 hours, have the bowels cleaned out and be given barley water. If the condition is recognized early, correction of the underlying cause will produce a prompt subsidence without the necessity of stopping the food.

Intestinal Findings in Diarrhea of Infants. The character of the stools in the diarrheal affections of infants is discussed by J. H. M. Knox.[1]

Mucus, he says, is evident to the naked eye in a large percentage and if it is absent there is slight probability of serious intestinal lesion. In all intestinal disorders large amounts of mucus may be found in the stools but in the greater proportion of cases a considerable excess of mucus occurs in connection with extensive intestinal alteration.

The appearance of blood in the diarrheal dejections of infants suggests an alteration of the intestinal mucosa commensurate with the amount. On the other hand, extensive changes may occur in the bowel wall without the microscopic presence of blood in the discharges.

In like manner the presence of pus in the diarrheal stools of infants indicates, according to its quantity, alteration in the mucosa, particularly of the large bowel. The failure, however, to detect pus with the naked eye does not preclude the possibility of extensive intestinal lesion.

Blood and pus are more frequently found in diarrheal movements in the middle half of infancy and at this time form a more reliable index of the conditions of the intestinal mucosa.

Blood and pus rarely appear in the diarrheal discharges of infants before the beginning of the second week of their illness. They are more frequently found from the third to the sixth or eighth week, and are usually absent after this period, when the illness, if it continues, may assume a marantic character.

Blood and pus are often found mingled in the same stool. Less often blood appears alone and still less frequently pus in the dejections of infants who have not passed blood. The presence of these elements indicates the probability of thickening and infiltration of the mucosa of the small, but more certainly of the large intestine.

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(1) Jour. Am. Med. Assoc., Oct. 17, 1908.

Epidemic Infantile Diarrhea. V. J. Glover's[1] theory as to the cause of epidemic infantile diarrhea is that the house fly carries the infection. The fly infects breast-fed infants by creeping into their mouths when they are asleep, for many infants sleep with the mouth slightly open or lips a little apart. The mouths contain a plentiful supply of saliva mixed with milk. Infants not breast-fed are infected via the ingesta by the fly, for instance, having fallen into the milk.

Intestinal Intoxication in Infants. In discussing the subject of intestinal intoxication in infants, R. B. Kimball[2] says that the poison is locked up in the bowel, there seems an effort on the part of the intestine to get rid of it, but it is often extremely difficult to stimulate the gut to empty itself. He does not know whether this is due to a torpor, an atony or an actual paralysis. Sometimes there seems to be a tetany of the muscular coats.

Calomel, according to the writer, is a very useful drug for the condition but should be given in $\frac{1}{4}$-grain doses, repeated according to the demands of the case. Doses of 1/10 grain are useless. Even for infants a few days old $\frac{1}{8}$ or $\frac{1}{16}$ of a grain is a better dose. If not effective in 2 or 3 hours, it should immediately be followed by a saline or castor oil.

Many writers prefer salts in solution to other cathartics. The sulphates of soda and magnesia are generally used for this purpose. They are very useful in dysentery, when given in small, repeated doses. Milk of magnesia is popular; it is antacid and prompt, especially if given with orange or lemon juice, but it is mild and not to be relied on in serious conditions. Cascara, in aromatic fluid extract, is good but slow, and liquorice powder is one of the best all-round laxatives in doses of a few grains to one-half dram, but it, too, is slow. Rhubarb, in syrup or tincture, is useful in mild diarrhea and has a secondary astringent effect, but, in all serious cases where promptness and certainty of action are indispensable, castor oil is the best, either pure or in the form of laxol. The latter preparation has no taste of castor oil, which is disguised by peppermint,

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(1) The Lancet, Sept. 5, 1908.
(2) Archives of Pediatrics, June, 1908.

but it is very sweet and not so good for continued use. Pure castor oil may be given every few hours for days and is harmless.

Enteroclysis is an indispensable maneuver in all intestinal affections. The chief indications for its use are bloody stools and tenesmus, which it will usually relieve. It should be employed in all high temperatures or other emergencies, but after the intestinal canal is thoroughly emptied irrigation should not be kept up unless it is necessary to relieve pain or remove bacteria or other toxic products that have accumulated in the intestine. In little delicate babies it is dangerous and may produce shock and serious laceration. It should be remembered that it is always more or less exhausting and that, in ordinary diarrhea, where the products of inflammation are few, it is often meddlesome and dangerous. The writer uses a No. 24 French catheter with 3 openings, one at each side and one at the end. The rubber should be as stiff as possible and highly polished and it should be at least 2 feet long, while the douche bag should hold 2 or 3 quarts. At first, it should be held about 2 feet above the child to make the initial current gentle and not excite too active peristalsis. The bag may be raised higher after the current is established. The tube is inserted about 2 inches and then the water allowed to run. As the rectum balloons the tube may often be passed up through the sigmoid flexure. If the first few attempts are not successful and the tube bends on itself, it is best to insert the finger and guide it. If after repeated attempts the tube will not go up, it is much better to discard it altogether and to raise the baby's buttocks and allow the water to find its own way into the colon; sometimes it will take great patience and it may be a long time before expulsive effects begin. If the long tube passes without too much delay and irritation, the water should be allowed to run until the child shows signs of uneasiness, then the tube and the nozzle should be separated and the water allowed to run out. This may be repeated until the water comes away clear.

Fresh milk should never be used in cases of intestinal toxemia until all trace of infection is gone; condensed milk, or other of the evaporated milk products, can be substituted after such an attack. A violation of this rule is likely to result in reinfection, often more serious than the original attack.

Equal parts of animal broth and cereal decoction seem to agree with most children: chicken, mutton or veal broth with equal parts of granum, barley or arrowroot gruels. The gruels should be made weak, about 2 drams to the pint, and digested with cereo or some other form of diastase. The arrowroot is usually reserved for cases of diarrhea. In acute cases, however, it is much better to give no food at all, simply pure water, or when there is vomiting, albumin water, consisting of one dram of brandy, white of one egg and one pint of water. All nourishment should be given in small quantities and a long enough interval allowed between feedings to permit of digestion, which, under these conditions, is always slow. In cases of very high temperature digestion, of course, is in abeyance and all food should be avoided. As convalescence is established, malted or condensed milk is used, the first for older children, the other for little babies. It should be very weak at first, one dram to 6 or even 8 ounces.

Fatty Acid Intoxication in Children. From the study of fatty acid intoxication in children L. Guthrie[1] concludes that acidosis or fatty acid intoxication may occur whenever the liver is excessively fatty. As acetone bodies are chiefly formed from fat, it is reasonable to suppose that their origin lies in the fat and in the liver and tissues. Although a normal liver is able to deal with enormous quantities of fat in its cells, a liver whose functions are deranged may not be able to do so.

A liver may become superfatted as the result of: (a) Excessive supply of fats and (indirectly) of carbohydrates in diet. (b) Inability to metabolize fat supplied or to make use of carbohydrates—as in glycogenic disorder (in cyclical vomiting). (c) Deprivation of carbohydrates (starvation). (d) Sepsis, acute or chronic, or the action of specific organisms; for example, in gastrointestinal affections or diphtheria or pneumonia. (e) Poisoning by phloridzin, hydrazin, phosphorous or chloroform.

The existence of a superfatted liver in itself is probably not dangerous, but it implies defective metabolism and

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(1) British Med. Journal, Oct. 17, 1908.

oxidation as a rule. Should metabolism and oxidation be further perverted by the action of a general anesthetic, fatal toxemia, not attributable to fatty acid intoxication alone, but to a general breakdown of all the hepatic functions—proteolytic, antitoxic and glycogenic—may occur, and in extreme cases necrobiosis of the hepatic cells (acute atrophy) may result. These results are not due to the specific action of chloroform alone, but may be the consequence of any general anesthetic administered in the presence of a fatty and disordered liver. At the same time chloroform in these conditions is the most dangerous anesthetic of all. In cases of preceding hepatic inadequacy, the administration of any general anesthetic may prove the "last straw."

Treatment by alkalies or carbohydrates affords but slender hope of cure in postanesthetic intoxication.

Subjects of cyclical vomiting, perhaps, those especially who live chiefly on fat and carbohydrates, are potential victims to postanesthetic intoxication.

Congenital Stenosis of the Pylorus. A case of congenital stenosis of the pylorus, treated by posterior gastrojejunostomy, is reported by C. L. Scudder,[1] this being the fifth successful case.

A boy baby 7 weeks old, nursed and gained in the first month, then began vomiting, projectile in character, this continuing daily until the operation. Examination showed a thin baby, presenting marked gastric peristalsis, left to right, a pyloric tumor indistinctly felt and constipation.

Three weeks of careful feeding failed to influence the symptoms and the operation was performed. For several days vomiting continued. The first stool came 52 hours later and they gradually became normal. Five months later, the baby was gaining ½ lb. a week and was well.

With reference to the diagnosis the author says that many cases with the signs of hypertrophic stenosis show no pyloric tumor. These are most probably due to pyloric spasm. Here all the symptoms are less marked and only the most severe cases would be confused with true hypertrophic stenosis.

The spasm cases will usually yield to medical treatment

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(1) Boston Med. and Surg. Jour., March 4, 1909.

and if the case was wrongly diagnosed as pyloric tumor medical treatment for the latter wins favor.

True pyloric tumor does not yield to medical treatment and this should not be tried longer than 2 weeks, lest the infant become too weak to stand the necessary laparotomy. Early operation is the best and safest treatment.

Congenital Stenosis of the Duodenum. H. L. K. Shaw and L. K. Baldauf[1] report a case of congenital stenosis of the duodenum.

The child, a girl, was born July 19, 1906. She seemed strong and healthy and weighed 7½ pounds. Twelve hours after birth she passed meconium. She was given small quantities of warm water and vomited a small amount of greenish fluid 15 hours after birth. She was placed at the breast 2 hours later and again in 2 hours and after the latter feeding vomited a small quantity of greenish fluid which contained particles of a white material, evidently milk curds. The next nursing was retained. On the next 2 days (the second and third after birth) she nursed at the breast, vomiting greenish fluid 5 times, once in large quantity. She passed meconium 3 times, seemed hungry and cried as if in great pain. On July 23 (the fourth day after birth) it was thought that the nervous state of the mother might cause the condition of the child. Nursing at the breast was discontinued and barley water and later whey were administered. A greenish-yellow fluid containing white particles was vomited almost immediately after each ingestion of food. Meconium was passed and later a brownish movement showing a small amount of mucus. On July 24 (the fifth day after birth) hot water was given in dram doses every hour and retained at the longest only 20 minutes. The stomach was thoroughly washed out after the removal of putrid, foul-smelling, greenish contents. During the night there were 3 small brownish dejections. On the sixth day after birth (July 25) the stomach was washed out twice and the child vomited only once (a clear fluid 2 hours after the last lavage). A napkin and some of the vomited material were examined and bile was shown to be present in both.

On each of the next 3 days the stomach was washed,

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(1) Albany Medical Annals, January, 1908.

whey was given by mouth and physiologic saline solution per rectum 3 times a day. Although the baby vomited only once in these 3 days, she grew constantly weaker and on July 29, 10 days after birth, she weighed 5¼ pounds, showing a loss of 2¼ pounds. Her condition gradually grew worse in spite of lavage, and, as an operation was deemed inadvisable on account of her exhausted state, she died on August 1, 13 days after birth.

Autopsy showed the following: A dilatation of the intestine, including the whole course of the duodenum and extending below the bile duct, giving the organ, from its size and general shape, the appearance of the stomach. The mesocolon of the entire ascending colon, except a small free edge about 0.5 cm. in thickness, was intimately adherent to the dilated duodenum.

Below the dilatation was a stricture which would not admit the smallest probe, but through which a small amount of fecal material could be forced. All other organs were normal.

Duodenal Ulcer in Children. Kuttner[1] reports a case of duodenal ulcer in an infant a month old and one in a child of 4 years. In neither instance was the diagnosis made during life. The ulcers were situated in the "unprotected" part of the duodenum above the papilla of Vater. No etiologic factors could be found in the previous history or upon physical examination. The older child suffered from a pseudomembranous colitis and the stools contained an overabundance of colon bacilli; some recent experimental work in the production of gastric and duodenal ulcers suggests that this organism may have an active part in the process. Kuttner thinks that often the so-called idiopathic pyloric stenosis of infants is really caused by the existence of duodenal ulcers.

The treatment of duodenal ulcer of infants and children consists in procuring as much rest as possible for the stomach. Food is given in small quantities, mainly milk, and should be administered cool or cold. In case vomiting persists rectal feeding must be temporarily adopted. Among drugs alkalies are most serviceable. The author holds that operation is especially indicated if internal

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(1) Berliner klin. Woch., November, 1908.

medical treatment has not been successful. If the surgeon is called to see the patient when suffering from a severe hemorrhage, operation is usually hopeless.

Spasm of the Anus as a Cause of Crying in Nurslings M. Plauchu[1] reports an unusual case of painful spasm of the anus in a nursling. For the first 4 or 5 days after birth the child seemed perfectly normal, but then began to cry so continuously day and night that he rarely got more than 2 hours' sleep in the twenty-four. No cause was discovered until rectal examination revealed a resistance and contracture of the sphincter. This was dilated with the little finger and the child immediately ceased crying. No fissure could be found to account for the spasm.

Lipoma of the Intestine. According to L. K. Baldauf,[2] lipoma is an infrequent intestinal tumor. Together with the rarity of the lesion, the early age at which it appeared in the case here cited, the peculiar symptoms to which it gave rise, and the fact that the literature contains no reference to a similar condition in an infant, makes the following report worthy of publication.

A girl of 14 months appeared for operation September 13, 1906, with symptoms of intestinal obstruction. She was born July 12, 1905, after a normal labor, was breast-fed and seemed well nourished at first but later showed slight signs of rickets. Two or 3 months after birth the mother noticed that the left side of the abdomen appeared unusually full and round. At that time there were no stomach symptoms, but a slight "colic" appeared each day for 4 or 5 months. The attacks later, however, diminished in frequency, there being intervals of 2 or 3 weeks during which the child seemed perfectly well. Defecation always occurred 2 or 3 times a day. The feces were soft in consistency; well formed stools were never seen.

The present illness began July 15, with vomiting and marked flatus. Rectal enemata were given and afforded complete relief. The child then remained well until August 7, when she had a similar attack and the same treatment again proved effective. The mother noticed a "bunch" in the left side of the abdomen which remained

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(1) Lyon Med., March 22, 1908.
(2) Albany Medical Annals, January, 1908.

after the attacks had subsided. The child had similar attacks on August 20 and 30. On September 9 continuous vomiting developed and marked constipation, which nothing could relieve. The patient became steadily worse and was brought to the Benedictine Sanitarium September 13, 1906. She was in a precarious condition; the pulse was barely perceptible, the abdomen markedly distended and vomiting continuous.

Upon operation a large pedunculated tumor was found occupying the left portion of the abdominal cavity and attached to the sigmoid flexure opposite the mesenteric attachment by a short pedicle 10 cm. in length. The tumor had rotated in such a way that the intestine was twisted twice. The tumor was removed by cutting the pedicle close to the intestinal wall. The child made an uneventful recovery and left the sanitarium 2 weeks later.

Pathologic examination showed the specimen to be a pure lipoma with numerous hemorrhages.

Salt Solutions in Acute Diet Disorders. Recognizing the difficulties of continuous subcutaneous infusions (especially in private practice) in the acute gastrointestinal disorders of infants, Heim and John[1] recommend the following simple procedure: The infant is deprived of all food for 24 hours and is given by the mouth about one liter of a solution containing 5 gm. of sodium chlorid and 5 gm. of sodium bicarbonate to 1,000 gm. of distilled water. In the large majority of cases there will be an increase in weight amounting from 100 to 600 gm. Fifty-six infants suffering from diet disorders of all degrees were treated on this plan; of these two died while 54 recovered. The authors relinquished the use of castor oil in all severe cases which they treated. As a result of their observations and comparisons they are convinced that by these salt solutions the period of convalescence is much shortened.

Treatment of Prolapse of the Rectum. N. A. Pephallinos[2] describes a method of treating prolapse of the rectum which has been employed by Spitzy, of Graz, in 32 cases. The prolapse is reduced, the rectum evacuated and thoroughly cleansed, and the neighborhood of the anus care-

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(1) Monatschr. f. Kinderheilkunde, February, 1908.
(2) Jahrb. f. Kinderheilkunde, 1908, LXVII.

fully disinfected. The armamentarium consists of a syringe with a capacity of 5 c.c. covered with a soft rubber mantle to prevent the rapid cooling of the paraffin, and a cannula needle 10 cm. long; paraffin with a melting point of 45° to 50° C. is used and kept ready in a water bath at a temperature of 60° to 65° C., also sterilized water at the same temperature. After the child is etherized, the warm syringe is filled with paraffin, ⅛ of which is then ejected and in its place hot water sucked up; the cannula, which cools off more quickly than the syringe, is thus filled with hot water and kept warm. The left forefinger is insorted into the rectum and the cannula is made to perforate the skin 1 cm. to the outer and posterior part of the rectum; it is pushed into the pararectal tissue to as high a point as possible parallel with the rectum; the inserted finger acts as a guide to the needle. Care must be taken not to perforate the rectal mucosa. The paraffin is then injected as the syringe is withdrawn. The procedure is repeated on the opposite side, thus supporting the rectum with 2 longitudinal rods of paraffin. The injection must be made quickly and with the same amount of force all along the line; when the syringe is within 1 cm. of the anal skin the injecting must cease or a paraffin clot will close the skin wound. A plaster dressing is applied and the child kept in bed 2 days. Of the 32 cases, 31 were cured and in no instance was embolism observed.

Acute Disturbances of Nutrition in the Nursling. B. Salge[1] lays stress upon the importance of recognizing the underlying disorders of metabolism in the acute digestive disturbances. These disturbances are either

(1) Purely alimentary or
(2) Infectious.

The first is due to overfeeding or too short intervals, with resultant intestinal putrefaction, setting free of irritant fatty acids and onset of vomiting and diarrhea. This he calls dyspepsia and the body is practically uninvolved.

Therapy consists in restricting diet to water or tea and saccharin, given cold if vomited warm. Also castor oil 2 c.c. every 2 hours, or calomel 0.01 gm. t.i.d. Diet of flour preparations 3 to 5 days, then return to milk or

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(1) Therap. Monatschrift, February, 1909.

Sorhlet's Sugar preparation, 5 to 10 gm. daily, without milk, for 3 days. Finally in starting milk regulate quantity and frequency of feedings, avoiding excess of fat.

Severer Group.—Gastrointestinal symptoms still prominent, vomiting and diarrhea. Restlessness extreme even to convulsions. Disturbance of consciousness as in meningitis. Temperature upset, both directions. Loss of body fluids, skin stiff and inelastic, mucous membrane dry, weight loss very rapid, urine scanty, pulse weak and rapid.

Treatment: Saccharine tea, 1 to 2 days; no catharsis and no opiate; saline transfusion, 150 c.c. twice in 24 hours, using .5% sodium chlorid, .5% sodium citrate.

Treat hyperpyrexia with cold packs in blanket, repeated 4 times in one hour and again once in the day, or lukewarm baths 3 to 4 times daily.

Hypopyrexia.—Artificial heat and hot tea per rectum.

Heart Collapse.—Camphorated oil 1 c.c. every 1 to 2 hours. Then for 3 to 6 days thin gruels and sugar solutions, continuing subcutaneous saline or, better, breast milk in very small amounts. To give larger amounts the fat must be centrifugal; begin with 30 to 50 c.c. in 24 hours, slowly increasing.

After 10 to 14 days of fat-free nutrition, begin adding fat slowly. There is no gain in weight during this time.

The temperature curve is a criterion of the convalescence. If breast milk is not available use whey produced with Pegnin.

Treatment of Chronic Constipation in Children. L. Kerr[1] discusses the treatment of chronic constipation in children under the headings of hygienic, dietetic, local and medicinal.

The hygienic treatment requires that the child be supplied with abundant sunlight all day and fresh air all the time. Free exercise of the sort that calls all the musculature into activity is essential. The writer believes that at the sixth week of life such training should begin. The infant should be held in the lap with his back supported against the chest of the nurse and then placed upon a vessel previously warmed. While in that position, the

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(1) American Medicine, October, 1908.

anus is gently irritated with the tip of the finger. Persistency soon brings its reward. This procedure may have to be repeated several days but the infant soon associates the position and surroundings with the act of defecation.

In the older child, nothing should interfere with the habit of attention to the bowel function. The hurry to get to school or play is an excuse not to be tolerated.

The dietetic treatment will vary as it affects infants or older children. If a breast milk is too rich in proteid and low in fat, regulation of the diet of the mother and suitable exercise will correct it.

Water should be given to all infants, particularly during the heated season, and oatmeal water is beneficial to babies over 2 months of age. Orange juice should be given not alone for its laxative effect but on account of its antiscorbutic properties.

Mixed feeding is the solution for some few cases but the dangers of artificial feeding must always be borne in mind. In artificially fed children it is a simple matter to change the proportions of fat, proteid or sugar. Here again the use of oatmeal water as the diluent is of known benefit. If the milk has been subjected to heating it should now be used raw.

The amount of orange juice may be increased or prune juice substituted. Cooked fruits are valuable. The different cereals, whole wheat or bran bread, green vegetables, and potatoes add elements which tend to correct the constipation.

The local treatment involves massage of the abdomen with the lubricated hand. The course of the colon is followed by the movements of kneading and this must be done once or twice a day for a protracted period. From 5 to 15 minutes is required for each seance, according to the age and strength of the child and the urgency of the case.

Cool sponging with immediate towel friction of the abdomen will benefit the mild cases.

Suppositories are immediate in result when the site of the trouble is in the rectum. In their selection it is only necessary to remember that glutin is less irritating than glycerin and therefore less effective. Enemata of water are effective, particularly if glycerin is added to them, in the proportion of 1 dram to each ounce. In older children good results have been obtained from a cool spray directed against the abdomen from 1 to 3 minutes at the time of the morning bath.

The medicinal treatment should not be indulged in until all other measures have resulted in failure. For the immediate evacuation of an irritating mass in the bowel, to allow the elaboration of other means of relief, the use of a single dose of castor oil may be helpful, but it must be remembered that its secondary effect is constipating. Therefore the use of equal parts of the oil with spiced syrup of rhubarb is more efficacious.

For more extended use, carbonate of magnesia in 2 to 5 grain doses is effective, as is also the milk of magnesia.

For steady systematic use there is no remedy which approaches in efficiency the various preparations of cascara sagrada. It ought never to be used as a purgative but in small doses. The maximum dose up to the eighteenth month should be 20 drops and the fifth year, 40 drops.

Diagnosis and Therapy of Diplococcic Peritonitis. H. Salzer[1] reports diplococcic peritonitis in 4 little girls between 7 and 9 years old. The patients were taken suddenly ill with severe abdominal pain and vomiting; diarrhea developed and the children grew very ill. At times there was loss of consciousness and cyanosis and fever. The pulse was small and rapid. In all cases there was herpes labialis. The abdomen was somewhat tympanitic and evenly distended, everywhere tender and with more or less muscular rigidity. A diplococcus was isolated from the blood. In the further course a peritoneal exudate could be demonstrated (dullness in the flanks).

The writer believes in waiting until there is a certainty of localized or free fluid in the peritoneal cavity before resorting to operative interference. In 3 instances this was established and laparotomy was performed between the third and tenth day, with recovery. The fourth child gave no evidence of free fluid and recovered in 4 weeks without operation.

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(1) Wiener med. Woch., 1908, No. 13.

DISEASES OF THE DUCTLESS GLANDS.

Large Thymus; Sudden Death. D. F. MacIntyre[1] reports a case of sudden death in a child due to pressure from an enlarged thymus. It was 3 months old, had nursed well in the evening, but early the next morning died suddenly in a convulsion. Autopsy revealed a large thymus extending nearly the whole length of the sternum and adherent to the pericardium and pleura on both sides. It extended back to the vertebræ and seemed to occupy a large part of the thorax. The heart and lungs were healthy, but displaced by the thymus. The liver and spleen were enlarged, the former noticeably so; the stomach and intestines were normal. The left kidney was somewhat enlarged, as were both adrenals. The thyroid gland was slightly enlarged. The brain was rather soft; the pineal gland was enlarged. Death was doubtless due to pressure by the enlarged thymus on the pneumogastric.

Primary Tumors of the Adrenal Gland in Children. W. Tileston and S. B. Wolbach[2] report a case of round-celled sarcoma of the adrenal gland and discuss in general tumors of this organ. Their patient was a 16-months-old infant who seemed perfectly well until early in August, 1906, when a purple discoloration of both lids of the right eye suddenly appeared. On August 26th, examination revealed the following: Exophthalmos of the right eye; diffuse hemorrhagic infiltration of the upper and lower lids; a soft mass measuring 1½ by 2 by 3 inches over the right temporal region.

The swelling grew rapidly and soon involved the whole temporal area. It was smooth, rather tense, and semifluctuating. The corresponding preauricular lymph glands were considerably enlarged. Examination of the other organs gave negative results.

During the 3 weeks at the hospital the exophthalmos increased slightly, the temporal growth and the metastases in the lymph nodes grew a great deal larger, and a slight ecchymosis appeared on the lower lid of the other eye. The lids on the right side had become almost black. There was

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(1) British Med. Journal, June 6, 1908.
(2) Am. Jour. of the Med. Sciences, June, 1908.

a slight injection of the palpebral and the ocular conjunctiva. On September 23, a small piece of the enlarged glands in front of the ear was removed and was reported by the pathologist to be a small round-celled sarcoma.

The infant soon fell into a deplorable state, with almost constant pain in the region of the right eye, which nearly left its socket, being pushed outward, downward and inward, so that it nearly touched the nose. The growth about the temple took on huge proportions while at the same time the cachexia increased. The patient died January 13, 1907.

At autopsy, besides the tumor of the head, which involved the temporal and parotid regions, in the abdomen was found a large soft, elastic mass, originating from the right adrenal gland, flattening the liver, right kidney and right lobe of the spleen and inferior vena cava, while the lower part crossed the spine and impressed the aorta and left kidney.

Microscopically the tumor was found to be a small round-celled sarcoma. The cells resembled the undifferentiated cells of the bone marrow.

For clinical purposes, tumors of the adrenal gland in children may be divided into four classes: (1) those with metastases to the skull (Hutchinson's type); (2) those of simultaneous sarcoma of the liver and adrenal; (3) those associated with precocious maturity, and (4) those not falling under any of the preceding headings.

It is in connection with the first of these types that the writer's case is cited. Hutchinson has recently called attention to this new clinical syndrome and reports 10 cases, 6 hitherto unpublished and 4 from the literature. It has hitherto been found only in infants or young children and shows the following characteristics: Spontaneously or after trauma there appears ecchymosis of one or more eyelids, soon followed by exophthalmos, which is usually one-sided. The eye protrudes more and there appears a growth in the adjacent temporal region, with enlargement of the lymph nodes in front of the ear and at the angle of the jaw. During life a tumor in the region of the kidney is felt only in a minority of cases (6 out of 14); most frequently it constitutes one of the surprises of the postmortem examination. The orbital tumor grows with great rapidity and death ensues early from cachexia and anemia. Optic neuritis may occur, but total blindness is the exception. Pain in the head is frequent, but vomiting, in spite of the extension inward toward the brain, is rare. The abdominal growth may be quite large and is then accompanied by swelling of the superficial abdominal veins, but never by ascites. There is seldom any fever. The urine, in the few instances in which it has been examined, has been free from blood and albumin. The blood shows a secondary anemia, which may become extreme. The white blood cells are not increased but there is usually a relative decrease of the polynuclear neutrophiles.

The early age of the patients deserves especial notice. Twelve of the 14 children were not over three years of age; 4 were under one year; 2 between one and two years; 6 between two and three years; only 2 were over three years, the eldest nearly nine. The male sex predominated, with 9 boys to 4 girls (in one case the sex is not stated).

The adrenal growth varies from the size of a walnut to that of a child's head. It is usually one-sided, but the right and left side are involved with almost equal frequency. On section the surface is smooth, gray-white or yellow, and mottled with hemorrhages. There is slight tendency to invade the neighboring tissues and organs. Metastases to the calvarium were present in all reported cases, to the ribs in four, to the spine in one, to the tibia in one; in one case the bone marrow and periosteum of several of the long bones were involved. These tumors are almost invariably sarcoma.

It remains briefly to consider the other forms of adrenal tumor in children. The second type, already referred to, is that of simultaneous sarcoma of the liver and adrenal. It has been well described by Pepper and is met with as a congenital tumor in the first weeks of life. Clinically there is enormous enlargement of the liver, without ascites and, as a rule, without jaundice. The liver is sometimes involved alone, usually in company with the adrenal. Histologically there is in all instances a diffuse infiltration with small round-celled sarcoma.

The third type is extremely interesting as to the relation of the adrenal glands to the growth of the body and sexual development. The disease is chiefly seen in girls of from one to eight years and runs a comparatively slow course, usually for several years. These children present a remarkable appearance, with the face and pubes abundantly covered with hair and the external genitalia as fully developed as in an adult. They are obese and abnormally large for their age, a child of five years having the size and general appearance of one of sixteen. Pigmentation of the skin may occur, but the color is more like that of a brunette or gypsy than like the bronzing seen in Addison's disease. The intellect is dulled and the disposition sullen. Appetite and sometimes thirst are increased and vomiting is likely to be an obstinate feature. The urine may contain albumin, due to the presence of blood, but holds no sugar. At autopsy there is found a tumor of the adrenal gland, usually large, reaching up to 3 pounds.

Almost all these tumors upon histologic examination show a structure more or less like that of the normal adrenal gland and, therefore, come into the group of the hypernephromas.

Other tumors of the adrenal occur in children but show no distinctive clinical features. Sarcoma, carcinoma, glioma and hypernephroma, without precocious maturity, have all been observed.

DISEASES OF THE CIRCULATORY SYSTEM AND THE BLOOD.

Pyopericardium in Children. Pyopericardium in children under 12 years is almost invariably associated with pulmonary disease, commonly pneumococcal in origin, according to J. Poynton.[1] The condition arises with the same frequency in both sexes, but in 83 per cent of all cases it occurs before the fifth year and in 66 per cent between the ages of 1 and 3 years. Primary pyopericardium is very rare. Diagnosis is beset with difficulties; the first is the usual absence of pericardial friction and the early age of the patient furnishes another; then there are almost invariably signs of severe pulmonary disease, like pneumonia, pleurisy and empyema, all of which distract

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(1) British Med. Journal, Aug. 15, 1908.

attention from the heart; and last, there is no endocarditis.

The cases may be grouped into 3 classes: (1) The acute, running their course in about 4 weeks and including 20 per cent. (2) The subacute, lasting from 4 weeks to 6 months, and including 50 per cent. (3) The chronic, with insidious onset, lasting from 6 months to over a year and including 17 per cent.

Among the more important signs are: (1) Progressive muffling of the heart sounds synchronous with enlargement of the cardiac area and marked percussion dullness over the pericardium and sometimes posteriorly in the interscapular region. Tubular breathing or absent breath sounds may also be noted in the interscapular region. (2) A rapid and extensive increase of the cardiac dullness upward toward the left clavicle. (3) The pear-shaped outline of a distended pericardium. (4) The abrupt transition from the dullness of fluid to resonant lung tissue. (5) A wavy and diffuse pulsation to the left of the sternum.

The most common error is to take half the truth for the whole, to stop at pneumonia or empyema. Another mistaken diagnosis is tuberculosis. The prognosis of suppurative pericarditis in small children is exceedingly grave and, unless a specific serum be obtained, improvement in diagnosis will not aid in treatment. Surgical intervention at present offers the best chance of success.

The Prognosis of Heart Disease in Children. In discussing the prognosis of heart disease in children, D. Stanley[1] says that one of the most important problems is the future of a child who has an organic valvular lesion. That future depends in great measure on the child's social environment. From his observations, extending over a number of years, the writer is convinced that great improvement may and does take place. If, however, the lesion be severe with much valvular deformity, if there be excessive hypertrophy, especially if there be any pericardial adhesion, or if there be any reason to suspect pericardial adhesion, the outlook is bad. It is difficult to say exactly what denotes a severe mitral lesion, but when the mur-

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(1) Brit. Journal Children's Diseases, July, 1908.

mur varies under observation, especially if a shifting diastolic be present as well as a systolic, the lesion may be regarded as severe. If a child with cardiac valvular disease grows, there is a better chance for the heart than if he remains undersized and puny, a point not sufficiently emphasized. The period of puberty requires particular attention and it is just at this time that the strain of education is greatest. It is then that there should be the greatest care and a period of daily rest on the back to compensate for the rapid growth of the great cardiovascular changes.

Anemias of Infancy. John Lovett Morse[1] finds that the distinctive characteristics of infants' blood under 2 years are:

Hemoglobin 70%. Red blood corpuscles, 5,500,000 to 6,000,000, with nucleated reds in the first days of life.
White Blood Corpuscles, 10,000 to 14,000.
Small mononuclears, 40 per cent. to 50 per cent.
Large mononuclears, 10 per cent.
Polynuclear neutrophiles, 33 per cent. to 45 per cent.
Eosinophiles, 1 per cent. to 5 per cent.
Myelocytes occasionally in first few weeks.

Blood changes develop very quickly and in the direction of the fetal type with splenomegaly. Leucocytosis also exaggerated, the increase being chiefly in the lymphocytes or non-granular cells.

The striking features in infantile blood disorders are relatively low percentage of hemoglobin, the relatively large number of non-granular leucocytes and the marked and rapidly shifting morphologic changes in the red cells.

Morse recognizes a congenital anemia due to insufficient iron reserve, defects in bone marrow or following severe icterus neonatorum.

Chlorosis as such probably does not occur.

There are many cases differing from a simple secondary anemia, i. e., the infant is fat, apathetic and has yellowish pallor with few digestive disturbances.

Blood findings:

Hb 50%, R. B. C. 5,000,000, W. B. C. 11,300. No

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(1) Jour. Am. Med. Assoc., Feb. 6, 1909.

other marked changes and the patient does well on iron. These cases occur indifferently in both sexes and have no pathologic connection with the nervous or genital systems.

Pernicious anemia: Rarely if ever occurs in infancy, (Hutchins accepts one case and Simon four) and if it occurs it is of the metaplastic type and shows the changes seen in adults.

Secondary anemia: Tends to great severity and is specially characterized by the very low Hb and the morphologic changes in the R. B. C.

Anemia with splenic tumor: Extremely frequent and the spleen is of all sizes. Morse believes these are not leukemias, the autopsies never revealing microscopic changes other than a secondary anemia and that they are not a leukemia stage of a leukemia since there has never been such a development traced in a given case, and finally because the leukemias are easily recognized when they occur.

Further, splenic tumor may occur without anemia; and in other cases the anemia responds to the same treatment as do the simple secondary cases without splenic tumor. Then these anemias with splenomegaly should be regarded as due to a disturbance of nutrition, the two pathologic findings existing independently and having no causal relationship.

Infantile Splenic Anemia, with Notes of Ten Cases. Walter K. Hunter[1] reports 10 cases of infantile splenic anemia, embracing the 3 types usually considered, 1st, that with a normal leucocyte count or leucopenia; 2nd, that with a moderate leucocytosis—14,000 to 20,000; 3rd, the anemia infantum pseudoleukemia of von Jaksch, with a greater number and variety of leucocytes and marrow cells.

In all of these types, the lymphocytes predominate, as a rule, but it must be remembered that the total leucocyte count and the lymphocyte percentage is greater in children than in adults.

He found no constant point in the etiology, most of his facts being negative. In 3 cases there was a history of measles, in one a history of diarrhea, and in 7 cases rickets was coexistent. Two of the children were twin sisters,

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(1) Lancet, Jan. 23, 1909.

while another case gave a history of a child in the same family dying of splenic enlargement. He concludes that the condition is a secondary anemia, due mainly to a functional disorder of the blood-making organs, a debility perhaps inherited, but depending (in common with other tissues) for its production chiefly on such facts as lack of suitable food and fresh air, but at other times determined by the toxins of measles, syphilis and other infections.

Under the proper hygienic measures, provided there are no complications, a cure may be looked for in time.

The Blood in Rickets. Leonard Findley,[1] noting the scant study of the blood condition in rickets and the diversity of opinion regarding the nature of splenic anemia and its relationship to rickets, investigated the blood picture in 30 cases of active and uncomplicated rickets in children between the ages of 12 and 42 months, and came to the following conclusions:

1. Anemia is not the rule and when it occurs is due to adventitious causes.
2. On the contrary, the amount of hemoglobin and the number of red cells in the series examined was notably in excess of the normal average.
3. The red blood corpuscles, as a rule, vary more in size than in normal individuals of similar ages, but otherwise there is no abnormality.
4. Nucleated red cells, polychromatophilia and myelocytes are of the rarest occurrence.
5. The leucocytes are but little affected and may be normal, slightly increased or even diminished in number. The mononuclears more frequently than the polynuclears show an absolute increase in number per cubic millimeter.

The Treatment of Anemia in Infancy with Citrate of Iron Administered Subcutaneously. Morse[2] treated 5 cases of anemia in infants by giving ¾ of a grain of iron citrate every other day, subcutaneously, with very good results. He finds the results more marked and obtained more rapidly than when iron is given by mouth and there is less danger of disturbing the digestion. The subcutaneous use of iron is especially indicated in the

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(1) Lancet, April 24, 1909.
(2) Jour. Am. Med. Assoc., July 10, 1909.

severe cases of secondary anemia with disturbance of digestion and in those of the chlorotic type.

DISEASES OF THE GENITOURINARY SYSTEM.

Diseases of the Bladder and Kidney Among Children. According to E. Portner[1] diseases of the bladder and kidneys are rarer among children than among adults and also more difficult to diagnose. As adequate therapy without a diagnosis is impossible, cystoscopy and catheterization of the ureters are recommended for diagnostic purposes. It is especially recommended in hematuria and pyuria which have lasted 4 weeks or more without a positive diagnosis. Cystoscopy and catheterization of the ureters is possible in girls from the first year and cystoscopy in boys from the second year, but urethral catheterization only from the eighth. It is necessary to use an anesthetic but the procedure is harmless.

Orthostatic Albuminuria. When albumin is found in a child's urine, it is important, according to L. Langstein,[2] to determine whether it is a transient (disappearing at night) or a permanent phenomena, and whether it is accompanied by casts and blood cells. Chronic albuminuria accompanied by casts is always highly suspicious of a nephritis. If albumin is found in the urine passed during the day only, the condition is called orthostatic albuminuria. This form has nothing to do with nephritis. For the diagnosis of orthostatic albuminuria the following postulates are to be filled.

1. The urine voided at night must be free from albumin.
2. The amount of albumin in the urine passed during the day must vary in amount. There may be only a trace in one portion, while the next voided may contain a large amount.
3. The albumin must be precipitated by cold acetic acid.
4. To a certain degree a large amount of calcium oxalate is of diagnostic value.

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(1) Deutsche med. Woch., Oct. 22, 1908.
(2) Therap. Monatschrift, March, 1908.

Clinically the picture of this condition is characteristic. Usually neuropathic female children are affected and headache, dizziness, nausea, weariness and palpitation are frequent symptoms. Objective examination shows a decided vasomotor excitability.

To substantiate the diagnosis it is necessary to measure the blood pressure and examine the backgrounds of the eye. In orthostatic albuminuria the backgrounds are never changed or the blood pressure increased. The heart shows vasomotor excitability and never the hypertrophy and accentuation of the second sound found in chronic nephritis. Often a latent tuberculosis is found in children suffering from orthostatic albuminuria.

Orthostatic albuminuria is never fatal in itself; the danger lies in the general condition with its predisposition to tuberculosis.

The writer treats cases of orthostatic albuminuria as he does those of chronic nephritis. He does not believe in long rest in bed with milk diet, for he thinks this lowers the general health. The patients should be treated much as normal children are, but should be especially protected from the cold and over-exertion. He does not advise a particular medication.

Urinalysis in Infantile Intestinal Affections. J. H. M. Knox and J. C. Meakins[1] found urine of abnormal character in 22 out of 53 cases of intestinal infection among infants.

In 7 of these cases the urine contained albumin and occasional hyaline casts as the only pathologic element (febrile or toxic albuminuria), in seven others the presence of pus cells was the chief characteristic, i. e., pyuria indicating pyelitis. In the remaining 8 albumin, casts and pus were present and indicated nephritis or pyelo-nephritis. The urinary changes were more frequent in ileocolitis than in dyspeptic or fermental diarrhea, although the extent of renal involvement seemed to depend less on the variety of the intestinal affection than on its intensity. The pyuria persisted in some instances without apparently interfering with convalescence; in others it yielded to urotropin; and in still others it developed into a serious

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(1) Archives of Internal Medicine. Oct. 15, 1908,

and fatal complication. The infection seemed to have its origin in the intestinal canal whence it reached the kidney either through the blood or lymph streams or by contiguity of structure. In these cases there was no evidence of urethra or bladder being involved or of ascending infection.

The autopsies, though few, clearly indicated that, while the kidneys frequently escape injury during enteritis, they become the seat of extensive secondary changes in this as in other forms of infection. The renal changes during intestinal disease in infants seemed to be those of degeneration—parenchymatous, hyaline and fatty—of the convoluted tubules rather than those of focal infection.

In a series of ailments other than intestinal infections and for the most part less acute in character no urinary abnormalities were discovered.

Indicanuria in Childhood. E. D. Fenner[1] discusses indicanuria in childhood and reports 5 cases. He says there are often met in practice among children cases which present a varied group of symptoms, mainly in the form of nervous disturbance, not attributable to any disease. The symptoms take the form of disturbed sleep, night terrors, mental depression, fretfulness and such change in disposition that a child ordinarily bright and cheerful becomes moody and irascible and cries almost for nothing. With these nervous symptoms there is generally associated a loss of appetite and often great disturbance of the bowels. These are capable of causing active symptoms and will nearly always reveal an excess of indican.

The treatment of this condition is both medicinal and dietetic. The diet is simplified as far as possible, meats and all sorts of sweets being prohibited or greatly reduced. If possible, sweet milk is replaced by buttermilk, at least for a time. The medicinal treatment consists in the administration 3 or 4 times a day of some intestinal antiseptic. A dose of calomel and soda is good to start with, then a mixture of salicylate and benzoate of soda, ½ to 1 grain; of the salicylate, 4-10 grain, and of the benzoate,

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(1) New Orleans Med. and Surg. Jour., November, 1908.

3 times a day, or combined with 1 grain of mercury with chalk and 3 grains of bicarbonate of soda. It is advisable to follow this treatment with a bitter tonic. In some instances, particularly when the breath is offensive, small doses of chlorate of potash are followed by prompt improvement.

The following case illustrates the condition:

E. G., 3 years old, had begun 6 or 8 weeks before to exhibit a remarkable change in disposition. She had frightful "night terrors," from which she could be aroused only with greatest difficulty. She grew suspicious and nervous during the day, running away and hiding at the approach of any except her immediate family. If she was taken into the street she clung to the hand or dress of her companion, in a street car she was in an agony of terror and screamed. Her appetite was capricious, but she showed no actual disturbance of digestion, except a moderate costiveness.

Careful examination of the child eliminated any organic trouble. But in the course of the investigation the urine was found loaded with indican. Immediately a course of treatment upon the lines laid down was instituted and resulted in rapid improvement with the disappearance in a few weeks of the whole train of symptoms.

The Urine in Diseases of Infancy. John Lovett Morse[1] notes that few observations have been reported concerning the urine and kidneys in diseases of infants and that the observers have differed markedly in their findings. He reports the urinary conditions in 667 consecutive babies at the Infants' Hospital and Floating Hospital, of whom only 13 were suffering from urinary diseases not connected with other conditions. He observed that, aside from gastrointestinal diseases, albuminuria and casts are more often found in pneumonia and meningitis than in the other acute infections. He did not notice that otitis media plays an important rôle in the etiology of infantile nephritis, or that renal complications are frequent in infantile eczema. In the diseases of nutrition, as a rule, no renal complications were present, although in scurvy and severe anemia

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(1) Annals of Gynecology and Pediatry, April, 1909.

the urine may show evidences of the characteristic hemorrhagic tendency. He finds that secondary kidney affections do not usually produce edema, but that the edema is usually due to some other cause than kidney disease. He considers the presence of casts and albumin in acute infections as a manifestation of an unusual degree of toxemia and of bad prognostic import in a general way. In most cases he believes that the pathologic condition does not go beyond an acute degenerative nephritis.

Nephritis in Infancy. According to George Carpenter[1] two facts about nephritis must be noted: (1) That the symptoms are often inconspicuous, and (2) that at autopsy kidneys which display pronounced microscopical changes are likely to appear healthy to the naked eye. A third peculiarity, infrequent but demanding recognition, is that repeated examinations of the urine may reveal neither albumin nor microscopic evidence of nephritis, while the kidneys at autopsy may still be found diseased.

Definite nephritis associated with gastrointestinal catarrh, occurring with and without fever, is more common than is supposed. Albuminuria may be associated with any complaint of the gastrointestinal tract, even with simple dyspepsia, apart from definite pathologic alteration in the renal epithelium. It is rare for dropsy to occur in association with this complication, the symptoms of which are submerged in those of the general disease. A microscopical examination of the urine reveals the kidney lesion. The absence of albuminuria does not negative nephritis, for a centrifuged specimen of an albumin-free urine may display renal casts.

Among other occasional causes of nephritis in infants may be mentioned pneumonia, varicella, erysipelas, meningitis, eczema, impetigo contagiosa, aphthous stomatitis, tonsillitis and tetanus. Some cases can be labeled primary for the want of a better description, for they arise without demonstrable cause.

Scarlatina so rarely attacks infants that scarlatinal nephritis is seldom encountered. For slight or centrifugal evidence of hematuria to be found in scurvy is common, but definite nephritis is not so often seen in this condition.

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(1) British Med. Journal, Sept. 26, 1908.

Syphilitic virus retards renal development and pathologic changes have been found in the kidneys, both antenatal and postnatal. These pathologic changes consist of infiltration of the interstitial tissue with small round cells, or even of sclerosis of the organs, sometimes with isolated microscopic gummata. In the tubules, fatty degeneration of the epithelium and obvious catarrhal inflammation have also been recorded. Further, the nephritis may be a combination of these pathologic alterations.

Fry and Martin record the examination of the urines of 100 infants under 3 months. In 7 of these infants examined postmortem, uric acid infarcts and parenchymatous inflammation were found. Three showed interstitial nephritis besides. Czerny and Moser also found interstitial changes in nephritis, secondary to gastrointestinal troubles. Interstitial nephritis, then, is not peculiar to the action of the syphilitic virus but may be produced by other poisons. Further observations on these points are needed and headway will not be made until the urine of infants is systematically examined in all cases, for that is the initial and important step in the clinical inquiry.

Diagnosis of Urinary Tuberculosis in Children. According to L. Green,[1] the views of urinary tuberculosis have completely changed during the last few years; for, instead of being regarded as relatively rare, difficult to alleviate and hopelessly incurable, the disease is now known to be exceedingly common, and, when recognized early and the primary focus removed, of distinctly good prognosis. Further, the view held for so long that the primary disease begins in the bladder and thence spreads along the ureters, causing a secondary infection of the kidneys, is entirely wrong. The disease almost invariably begins in one of the kidneys, whence it spreads to the bladder.

There are two points of diagnostic importance in the detection of the tuberculous disease of the urinary organs; first, attention should be given to the slightest disturbance, discomfort or undue frequency in the act of micturition, and, second, the routine examination of a urine should

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(1) British Jour. of Children's Diseases, July, 1908.

include a bacteriologic as well as the ordinary chemical and microscopic tests. The systematic examination of the urine of all patients suffering from albuminuria, irrespective of whether pus or blood is present, reveals the presence of tubercle surprisingly often.

For 24 hours the urine should be collected and a little carbolic acid added, the whole placed in a tall cylindrical vessel for 24 hours with subsequent centrifugation of the deposit and the preparation of stained films. It will then rarely happen that specific bacilli cannot be detected. A suspicion of tuberculosis should always be awakened when, in spite of the pus cells in the urine, none of the usual pyogenic microbes are found. If they are not detected by this method in a suspected case, subcutaneous or intraperitoneal injection into a guinea-pig is advised. The opsonic index, Calmette's conjunctival reaction or Pirquet's cutaneous reaction to tuberculin are additional tests. Calmette's reaction is more valuable than the opsonic index. The only reaction that gives a clue to the site of the infection is that produced by the subcutaneous injection of Koch's old tuberculin. If used continuously in suitable surgical cases it is a highly valuable diagnostic agent, for the reaction which follows its use frequently, though by no means always, indicates through localized pain or tenderness the site of the trouble. In tuberculosis of the urinary organs the injection often temporarily produces such an alteration in the character of the urine by the presence of pus cells and tubercle bacilli as to clear up all doubt of the nature of the trouble.

In practice it is necessary to determine (a) whether the bladder is involved, and, if so, to what extent, and (b) what is the condition of each kidney. Especial attention should always be paid to the condition of the ureter. If the kidney is tuberculous, the patient generally complains of pain on pressure over the course of the ureter, especially at the hilum of the kidney at the point where the ureter passes over the brim of the true pelvis and at its entrance into the bladder. Rectal examination is valuable; when affected by tuberculosis the ureter can almost always be felt as a cord-like structure, indurated and sensitive. The extent of the involvement of the bladder may be roughly gauged by its tolerance of distension. But to gain anything like an exact idea of the condition of the urinary organs a cystoscopic examination is essential. Cystoscopy can be practiced even in the youngest girls and in boys over 8 years of age. In the early stages of kidney tuberculosis the bladder may be quite free from ulceration or gross lesions of any kind, but it is rare that a careful inspection of the opening of one of the ureters does not give some indication of the trouble, like hyperemia and inflammatory edema of the lips of the opening, pouting, gaping or retraction of the orifice. If the tuberculous lesions are grouped wholly or largely around the mouth of one ureter and the rest of the bladder wall is healthy, there is strong presumptive evidence that the kidney on that side is the origin of trouble. But every now and then it is found that the lesion in the bladder is most marked on the side opposite to the affected kidney. A valuable adjunct to the simple cystoscopic examination is the so-called chromocystoscopy, observing by means of a cystoscope the excretion by the kidneys of a pigment (carmine blue) injected subcutaneously. A jet of blue-black urine will be seen squirted from time to time into the bladder by the peristaltic contractions of the ureter. If the urine is seen entering the bladder in regular forcible squirts of dark-blue fluid from both ureters the presumption is that both kidneys are healthy. The only way in which a really accurate knowledge of the condition of the kidneys can be gained is by collecting the urine as it is secreted from each kidney separately. Unfortunately the finest catheter cystoscope which can be made is too large to permit of its passing down the urethra of a boy under 12 or 13 years of age, and consequently many times the catheterization of the ureters cannot be undertaken in children. In some cases, however, there are numerous tubercle bacilli in the urine, with perhaps an occasional attack of transitory hematuria, when the simple and chromo-cystoscope and palpation fail to show on which side is the lesion. To decide the point an exploratory nephrectomy may be done, but this is an operation of considerable severity for the child and may be attended by severe hemorrhage difficult to arrest. A much simpler procedure is to expose the ureters subperitoneally by a small incision in the semilunar line of the abdominal wall, open each by a small longitudinal cut and insert a fine urethral catheter, so collecting the urine separately. When the examination is completed a fine stitch closes the opening in each ureter, which is then dropped back into its place and the wound drained for a day or so. If the urine from the two kidneys has been collected separately, there is rarely any difficulty in determining the site and extent of the disease and the functional activity of each kidney.

DISEASES OF THE SKIN.

Disseminated Miliary Tuberculosis of the Skin. Tileston[1] reports 7 cases from his own practice, and 3 others, calling attention to the occurrence in infantile miliary tuberculosis of a skin eruption, rarely alluded to in textbooks and seldom recognized by the profession. This rash he considers fairly common in infantile tuberculosis, and at that age almost pathognomonic of general miliary tuberculosis. The rash once seen is readily recognized and can be confused with no other skin lesion. It consists of scattered, discrete pin-head size papules, which are soon capped by vesicles with cloudy or purulent contents, which rupture or dry up and leave a crust. The lesion now is 2 to 3 mm. in diameter and consists of a flat papule, only slightly elevated, of a dull red color, often glistening. The center is occupied by a crust, on the removal of which a minute, sharply defined hollow is seen. On healing a tiny white scar appears, surrounded by brownish pigmentation. The individual lesion lasts for from one to several weeks and the spots appear in crops, so that all stages are present at one time. The eruption is not symmetrical or profuse, and is usually confined to the parts covered by the diaper.

Out of 32 cases of tuberculosis in babies, 7 showed the eruption, and some of the cases were seen only once by the author. All of the children with spots who came to autopsy had miliary tuberculosis.

In general in the chronic cases the patients are more apt to have spots, in the acute the patients die before the eruption has time to develop. Although the rash itself causes no symptoms it is of great importance in the diagnosis and prognosis, for all of the 10 patients reported in this paper died of general miliary tuberculosis.

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(1) **Arch. of Int. Med., July, 1908.**

The tubercle bacilli were found in 70 per cent. of the cases of the skin lesions, sometimes in large numbers; otherwise the lesions show no characteristic histologic picture.

Concluding he says:

1. There occurs frequently in miliary tuberculosis of infants and young children a specific eruption which is of great diagnostic importance. It is seen sometimes in patients who do not show a tuberculin reaction, and when present is of greater prognostic value than the positive tuberculin reaction, which occurs in a large proportion of all children from the lower classes (von Pirquet). The eruption in question, on the other hand, indicates almost certainly a fatal outcome.

2. The eruption is due to the deposit of tubercle bacilli in the skin, reaching the skin by means of the blood current.

Treatment of Eczema by the Finkelstein Method. O. Mendelssohn[1] has obtained excellent results in the treatment of eczema by Finkelstein's method. Finkelstein believes that eczema is caused by the whey-salts of the milk. He recommends the following,—a liter of milk is coagulated with pegnin, about 1-5 of the whey is discarded and replaced by barley water. This is passed through a fine sieve and from 20 to 40 gr. of sugar added. According to Finkelstein with this diet and without external treatment after 3 or 4 days the eruption becomes paler, the secretion is lessened, after a week the secretion has entirely ceased and by the third week the eruption is entirely cured except for a slight redness and roughness of the skin. Mendelssohn tried this treatment in 3 cases and recommends it highly in cases of eczema occurring in fat, pasty children.

A Case of Erysipelas Treated by Streptococcus Vaccine. A case of erysipelas treated by streptococcus vaccine is reported by J. H. Borden.[2] The patient was a three-weeks' old child who had accidentally received a scratch on the nose. Three days later a brawny swelling began to spread so rapidly that 24 hours after it was first noticed it in-

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(1) Archives of Pediatrics, July, 1908.
(2) Deutsche med. Woch., Oct. 15, 1908.

volved the entire nose, the upper lip and both cheeks half way up to the ear. Then it extended, presenting a typical elevated and serrated border, to the forehead, thence over the entire scalp, the loose tissue of the neck, which became intensely injected and brawny, the chest to the nipples, the skin over the deltoids, and reached the level of the shoulders behind. The fifth day after the onset the eyes were completely closed and could not be opened; there were numerous blebs at the site of infection and over the forehead and cheeks, and the copper-hued face and head appeared as large as in a child of three.

Throughout the course of the disease the baby nursed every 2 hours, retaining nourishment well and vomiting only occasionally. Besides the breast feedings she was given ten minims each of a mixture of brandy and panopepton, well diluted, at intervals of 2 hours. This was the sole internal medication. The colon was irrigated twice a day with hot saline solution until the return flowed clear. Morning and night a hot bath was given. The air of the sickroom was kept constantly pure. The local applications employed were ichthyol, 25 per cent., and 40 per cent. strength in lanolin; this ointment with 10 per cent. iodin in addition, tincture of iodin and a 50 per cent. solution of silver nitrate.

On the third day of illness cultures were taken on agar from the advancing border. They were sent to the Cornell Laboratory for incubation and preparation of a vaccine, but no growth resulted. However, Dr. T. W. Hastings returned a vaccine, prepared by him 2 days before from a case of erysipelas then in Bellevue Hospital. On March 31, 116 hours after the onset, while the temperature was 103° and the application of silver nitrate and of ichthyol-iodin ointment had apparently limited the advance on the chest, 3,000,000 dead streptococci were injected into the muscles of the thigh. Three hours later the temperature was 104.9° and the heart beat about 140 to the minute, distinct and regular. The prostration of the patient had increased. Twenty hours after injection the temperature was lower than it had been at any time for 3 days and the face had entirely cleared. A second injection of 4,000,000 streptococci was given and followed by a slight rise and the drop to normal within 36 hours. The patient passed the first normal bowel movement since the inception of the disease and all swelling, edema and induration, except for a small area in the neck, disappeared. The further course to complete recovery was uneventful.

While the writer recognizes the futility of estimating from one instance the efficacy of a method of treatment, still he feels called to emphasize the noticeably beneficial influence of the streptococcus vaccine in this case.

DISEASES OF THE NERVOUS SYSTEM.

An Extraordinary Case of Hydrocephalus. M. Knowlton's[1] case of hydrocephalus is of interest because of the unusual size of the head.

The patient, a female child, was born July 24, 1906, and weighed 5 pounds. She was the first child of her parents, both of whom came of large and healthy families. The mother was slender, weighed about 114 pounds, and was 19 years old when the child was born. The birth was natural, though the mother said that she was in labor two days and one night. The mother first noticed that the baby's head was somewhat large when 2 months old, but others had noticed that it was not normal at birth. The head steadily and rapidly increased in size.

The head measured 40 inches in circumstance and 29 inches from ear to ear over the crown. Distance from bridge of nose to edge of hair, 8 inches. Pulse 140, respiration 40. There were tonic contractions of the muscles giving rise to clenched fists and drawn limbs, a condition which prevailed during the entire life of the child. There was also considerable deformity of the thorax, the anterior-posterior diameter being greatly increased. There was little if any mentality.

A Case of Anorexia Nervosa in an Infant. A case of anorexia nervosa in an infant is reported by J. P. Griffith.[2] Morton G., the son of a physician, was born May 22, 1901. He was never ill until he was 9 months old, when he sufferd from an attack of ileocolitis, which lasted a month.

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(1) Jour. Am. Med. Assoc., July 11, 1908.
(2) Archives of Pediatrics, May, 1908.

After recovery from this the child appeared to have an aversion for anything given in a spoon or glass. He took the breast readily and would eat bread held in his hand. An effort was made to wean him, but he objected so decidedly that breast-feeding was continued, and he was given bread, which was the only thing he would eat. Milk, broth or any other food presented in a bottle or cup was absolutely refused. Finally, however, toward the end of January, 1903, as he was 20 months old, weaning was deemed imperative.

After 4 weeks of faithful, persistent but futile effort on the part of the parents to make the boy eat, the systematic employment of gavage was recommended as the only possible way to check the loss of weight and strength. The subsequent history was most interesting. For 3 weeks the child was given peptonized milk regularly 3 times a day by gavage. In addition, he took a very small quantity of bread or zwiebach. As a result, he gained weight, but, as his antipathy for all other food continued, the gavage was persisted in 3 times a day for about 6 months, the food consisting of a glass of peptonized milk and a raw egg at breakfast and again at supper, with beef juice and a glass of peptonized milk for dinner. If a larger quantity than this was given, vomiting followed. Renewed efforts at compulsory feeding was consequently made, bribes and threats being employed, and the anorexia was gradually overcome when the child was about 2 years and 3 months old. He still, at 6 years, has to be almost forced to eat and, if left to himself, will take extremely little.

This distaste for food in general and the dread of any new article of diet the writer believes is still the expression of the nervous anorexia which showed itself even in the first year. There was no evidence of organic affection of the gastroenteric tract or other cause to which it could be attributed, except that perhaps the administration of medicine at the age of 9 months awakened a fear of anything put into a spoon. Instead of disappearing soon, as is usually the case in convalescent infants, this dislike intensified and extended finally to all food and methods of giving it, except the two to which the child had already become accustomed, milk sucked from the breast and bread eaten from his own hand.

Dietetic Causes of Nervousness in Children. In addition to the herditary nervousness of children, Siegert[1] says that there is another form which is proved to be acquired. The most important cause of this type of nervous disturbance is improper diet, especially the so-called "nourishing" diet often prescribed for children. Usually there is an overabundance of proteid, while fat also is well represented; vegetables and fruits are freqnently not given because their nutritive value is presumed to be small. Restlessness, lack of attention in school, constipation, anemia, skin affections, night terrors and insomnia are often caused by this disproportion between the requirements of the organism in proteid and fat and the quantities of them consumed by the child. No medicinal treatment proves of any use, but change in diet, with an increase of vegetables and fruit and a gradual but decided reduction of proteid and fat, soon leads to amelioration of the symptoms and finally to complete health. The treatment, then, is very simple, but the diagnosis is made difficult by the widespread idea of the inherited character of most nervousness in children. A complete history with details as to the amount and kind of food given is the best aid in arriving at the correct understanding of the condition. The treatment, too, while simple, must be faithfully adhered to for a long period. By so doing the child may be saved from reaching maturity handicapped by a badly balanced nervous system.

Melancholia in a Child. J. B. Bridger[2] reports a case of melancholia in a girl of 3, an exceedingly rare occurrence. The trouble was thought to be due to ill treatment at an institution from which the child was removed to a day nursery. She was in good physical condition, would eat anything given her, slept well and never showed displeasure at anything said or done to her. Gradually it was noticed that experiences pleasant to other children made no impression on her. She did not care to play with others and would sit all day in a corner by herself or remain wherever she might be placed without any apparent desires. She would eat when given food, but she would never even carry to her mouth a stick of candy placed in her

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(1) Münchener med. Woch., Sept. 22, 1908.
(2) Memphis Med. Monthly, October, 1908.

hand unless told to do so. She would void her urine or evacuate her bowels only at the dictation of the nurse. At the height of the condition she would lie or sit in bed absolutely motionless, take no notice of her surroundings, and could not be induced to smile or say a word. She would react very feebly to any form of cutaneous stimulation and would, to a certain degree, tolerate pain rather than move. There was slight resistance to any attempt at passive movement of arms or legs, and the limbs would retain any position given them. The writer has caught her hand while walking, then stopped suddenly, releasing his hold on her outstretched hand, and played with children immediately behind her, without her lowering her arm or changing her position in any way for 15 minutes by the watch. At other times he would leave the arm outstretched and quit the room, watching her for an hour, without her knowledge, from a window at her back and discover no change in her position. The matron of the nursery had often noticed her retain an unnatural position for hours unless told to move, or unless her position was changed by someone. She gave the impression of one hypnotized, but her submissive mind was subject to any one's dictation. The only treatment given was outdoor air, good nourishing food, regulation of bowels, syrup of iodid of iron and the best possible environment. The first improvement was noticed in the cataleptoid condition and gradually but slowly the child became brighter, more talkative and after about 3 months was apparently normal in every way.

Inferior Polioencephalitis in a Child of Four. C. F. Judson and H. Carncross[1] report a case of inferior polioencephalitis in a child of 4 years.

Three weeks before the child was brought to the hospital the mother noticed that he was "stiff" on coming downstairs in the morning. After breakfast, however, the child played about as usual. The mother soon noticed that he staggered and that his right eye was turned inward. He held his head to the right side, although he was able to move it in all directions. He continued to play but seemed dull. During this time he had a cold and paroxysmal cough.

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(1) Amer. Jour. of the Med. Sciences, December, 1908.

He was particularly stupid just before he was brought into the hospital and staggered a great deal on the way there. The examination of the boy showed him to be well developed and of good color. In addition to mental hebetude, incontinence, cerebellar ataxia and loss of deep reflexes, there was paresis of both external recti, more marked on the right side, with deviation of the tongue to the left and an extremely slight obliteration of the nasolabial fold on the left side. The temperature showed slight elevation which persisted for 2 weeks. The average was from 99° to 100° F. It then gradually dropped to the normal line. The pulse ran from 100 to 120 and the respiratory rate from 25 to 30.

A few days after admission the patient became a little brighter, and a week later the paresis of the external recti less marked. There was at this time also only an occasional incontinence of urine and no longer any tremor. The boy continued to grow brighter and in one month the ocular palsy was much improved. The tongue at this time was slightly deviated to the left. The ataxia persisted and the deep reflexes remained absent.

An analysis of the case shows that the motor symptoms were confined to three cranial nerves: the twelfth on the left side, the sixth of both sides, and possibly the left seventh. The involvement of the sixth was very much more marked on the right side. There was no other motor involvement and the only additional symptoms to determine a diagnosis were the ataxia and loss of deep reflexes.

The writers decided, from the combination of the paresis of these few cranial nerves and the cerebellar ataxia, to locate the disease in the pons and medulla, and after excluding syphilis, tuberculosis, thrombosis, embolism and hemorrhage concluded that it was a polioencephalitis.

The course of the disease, with mild febrile disturbances and the marked mental hebetude which at one time after the boy's admission to the hospital approached stupor, confirmed the diagnosis of polioencephalitis. The disorder also developed at the end of an epidemic of poliomyelitis, which occurred in Philadelphia and in other parts of Pennsylvania in the autumn of 1907.

The writers think this case is of interest because it forges one more link in the chain which unites poliomyelitis and nonsuppurative encephalitis, because it illustrates the inferior type of polioencephalitis, because it shows how this disease may run a comparatively mild course to complete recovery and because it followed an epidemic of poliomyelitis.

Cases Illustrating the Pseudoparalyses of Early Childhood. Frank C. Neff[1] reports 2 cases of rachitis, 1 of scurvy and 3 of syphilis showing pseudoparalyses. His conclusions are as follows:

1. Pseudoparalysis is not rare in rickets, scurvy and syphilis.
2. When it is the earliest symptom noticed in these diseases diagnosis is difficult. Other evidence should be looked for.
3. It would be hard to group three other such serious conditions of childhood which have so favorable an outcome under early treatment.

Lumbar Puncture. A description of the technic of lumbar puncture is given by E. Burvill-Holmes.[2] To prepare the site for operation as for an abdominal section is unnecessary. Scrubbing the parts with tincture of green soap and water for a minute or two and then washing with sterile gauze soaked in 95 per cent. alcohol suffices. The needle should be well boiled and the operator's hands rendered aseptic. The writer requires the patient to sit up when circumstances permit. As a matter of fact, it is often found that the fluid will not flow when the patient is in the recumbent posture but will immediately when he is raised to sitting, and this when the needle has been left in the original location.

The instrument may be either an ordinary hypodermoclysis or aspirating needle of the Tuffier or Pravaz type, or a small trocar and cannula. It should be 9 or 10 cm. long, with a lumen at least 1 mm. in diameter. The trocar and cannula is to be preferred, because, if with a hypodermoclysis needle one fails to strike the canal, a bent if not broken instrument is the inevitable consequence.

The subarachnoid space can be reached by this operation at different levels in the lumbar region, between the third

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(1) Jour. Am. Med. Assoc., May 8, 1909.
(2) Archives of Pediatrics, October, 1908.

and fourth lumbar, fourth and fifth or what has been called "Chipault's sacro-lumbar foramen," the space between the last lumbar and the first sacral. The canal is reached at a distance of from 2 to 3.5 cm. in children and from 6.5 to 7 cm. in adults, according to the obesity or muscular development. The amount of fluid to be removed depends a good deal on the object. For diagnostic purposes 2 or 3 c.c. are sufficient.

The spinal fluid under normal conditions is absolutely clear with a specific gravity of 1.000 to 1.002 and contains a trace of albumin. Its reaction is alkaline. While not entirely without cellular elements, it is practically so, since it is only after a long search over a great many fields that a single cell can be found. In most acute inflammatory conditions of the meninges the fluid, on the other hand, is turbid, varying from a slight milky opalescence to a thick yellow fluid, according to the number of cells—pus cells for the most part—which it contains. However, out of 150 or more cases of epidemic spinal meningitis one showed clear fluid almost acellular, yet containing many meningococci. In meningitis due to the *Bacillus tuberculosis* the fluid is usually clear, though often of a milky turbidity. In the clear fluid are frequently to be seen more or less fibrinous coagula in which the bacilli can be found. The reaction of the fluids in both the epidemic and tuberculous forms of meningitis is always alkaline. The pathologic fluid contains more albumin than is present normally and the specific gravity is increased often to as high as 1.012. In some instances glucose is to be found.

To the study of the number and kind of the morphological elements contained in such exudates the term "cytodiagnosis" has been applied, and the following technic adopted with certain modifications. The fluid is poured into a tube and centrifugalized. The resultant sediment is at once smeared on a glass slide and stained and an estimate made of the cells noted. As a general thing, any of the ordinary blood stains is suitable, or even Loeffler's methylene blue. The cellular structures for study are the polynuclear cells, lymphocytes—large and small—and endothelial cells.

The writer took into consideration solely the percentage index of the polynuclear variety of cell and the lymphocyte, on the grounds that a predominance of the former means an acute infective process, while tuberculous effusions exhibit a lymphocytic excess. In 5 cases of the epidemic variety punctured late in the disease the writer found the ratio of polynuclears to lymphocytes as follows: 83:17; 84:16; 91:9; 86:14; 98:2. Here 1 case, even as late as the thirteenth week, showed a marked polynucleosis. Thus early in the course of the epidemic variety of meningitis, and this means cases of a duration of 21 days or less, polynucleosis invariably obtains, these cells being as numerous as 98 per cent. of the whole.

The spinal fluid in 7 cases of what proved on autopsy to be tuberculous meningitis was also examined. The ratio of the polynuclears to lymphocytes in 5 cases was 0:100; in one 1:99. The seventh case is of especial interest and the history is quoted in full.

The patient was a schoolboy of 7 years, who was admitted to the hospital on the third day of an attack of epidemic cerebrospinal meningitis. The cytologic formula was 96:4, with many Gram-negative diplococci, which on culture proved to be the specific organism of the disease. The boy slowly convalesced until the fifty-fourth day, when it was deemed necessary to send him to another hospital for further treatment and care. A lumbar puncture was made before his transference to ascertain whether the organism persisted. It was not found but instead many bacilli, which proved to be tubercle bacilli. The cytologic count was now polynuclears 41 per cent., lymphocytes 59 per cent. Of course, this lymphocytic predominance might have been but the evidence of the chronicity of the disease; nevertheless, it is of interest that with the reversal of the cytologic formula the tubercle bacillus made its appearance.

After these considerations, despite the fact that there is seldom tuberculous involvement, it would seem that cytodiagnosis is at least of some value, if not, as Sahli expresses it, "The sole foundation for diagnosis." The writer believes that when there is doubt or when the meningococcus on the one hand and the tubercle bacillus on the other cannot be demonstrated, a cytologic estimation is of great advantage and should be made, particularly when there is at command an operation so easy of performance and practically so free from danger, if the ordinary precautions are taken, as lumbar puncture.

Treatment of Chorea. Koplik[1] points to the dangers in the indiscriminate use of Fowler's solution in treating chorea. He finds that patients treated with this drug usually have albumin in the urine and even casts and blood. Albumin appears before any other sign of toxic action of the drug and is an indication to discontinue it. Fowler's solution grows stronger with age. Patients do as well without arsenic. The treatment recommended is a modified rest cure with some mild sedative, like trional, and, when indicated, strychnin as a tonic. Hydrotherapy is always useful. Salicylate of soda may be tried but continued only if well borne. Digitalis should not be used. The author believes that isolation and darkened rooms are not indicated for children, who thrive much better with quiet companionship and fresh air.

J. Burnet[2] believes chorea is essentially a rheumatic manifestation, the movements being merely an exaggeration of the natural restlessness of rheumatic children, and he bases his treatment on this assumption. The use of arsenic is generally recommended, but he objects to it on these grounds:

1. Large doses have to be given and may induce neuritis.
2. The results are rarely permanent.
3. The drug exercises no influence over the complications and sequelæ of chorea.
4. It does not benefit in any way the rheumatic constitution of the patient.

Burnet believes the salicylate group is of infinitely greater value, and of this group aceto-salicylic acid the drug to be preferred. It must be borne in mind that alkalies, like sodium bicarbonate, must not be given with this remedy, as in the presence of dilute alkalies aceto-salicylic acid becomes rapidly disintegrated. It is best given suspended in a glass of lemon-water, but may be given in cold milk or in cachets. The tablet form of administration is valueless. As to the dosage of aceto-salicylic acid, 5 grains

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(1) Medical Record, February, 1908.
(2) British Jour. of Children's Diseases, October, 1908.

as an average amount have been given without any bad effects and with considerable benefit to the patient.

The treatment of chorea, however, by drugs alone is not satisfactory. The patient should in all cases remain in bed. The ideal diet is milk only, but this it is practically impossible to enforce. Accordingly in addition to milk, not as substitutes, milk puddings, with stewed fruit by way of variety and occasionally chicken soup, fish and chicken may be ordered. Massage has often an effect truly marvelous. It strengthens the muscles and materially soothes the nervous excitability of the choreic patient. An occasional dose of calomel is also of advantage. In fact, no day may pass without an evacuation of the bowels, as constipation always aggravates the condition.

Nerve Strain of School Children. The increased school requirements, the higher standards set in all the professions and the insane American spirit of emulation of one's neighbors has resulted in setting a pace in our schools which is suitable rather for the brightest than for the average of the duller pupils, and the strain to which all the children are subjected, combined with the utter lack of systematic physical development, is producing a race of neurasthenics in our midst, according to L. W. Flanders.[1] Preventive measures suggested are:

1. The child should not go to school until 7 years old.
2. Separate rooms for study and recitation—so the studying child may be free from disturbing influences.
3. Compulsory eye examinations once a year with lenses fitted by a state oculist.
4. For college admission a physical examination as rigid as for the United States army or navy.
5. A more elastic curriculum for pupils in delicate health.
6. A most careful study of the child by teacher and parents to keep him from overworking.
7. The best of teachers, liberally paid.

MISCELLANEOUS.

Inunction Method of Administering Drugs to Children. B. K. Rachford[2] has made certain experiments upon the

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(1) Boston Med. and Surg. Jour., Feb. 25, 1909.
(2) Amer. Jour. of the Med. Sciences, January, 1909.

absorption of medicines given by inunction, using guaiacol, iodin, oil of wintergreen and salicylic acid. These medicines, with the exception of iodin, were combined with anhydrous lanolin in the proportion of 1 dram to the ounce; a 6 per cent. iodin-vasogen was used.

Before applying the ointment the skin of the chest and abdomen was carefully washed with soap and warm water and hot, moist towels were applied for a few moments to warm and redden the skin. One dram of the ointment was then very carefully and gently rubbed into the skin of the chest and upper part of the abdomen. The inunction was continued from 5 to 10 minutes. Previous to the inunction the child's bladder had been emptied, and directions were given to save all urine passed. If at the end of 2 hours no urine was obtained, the bladder was emptied by catheterization and subsequent specimens of urine were also saved for examination. The urine thus obtained was examined for evidence of the drug administered.

Among 8 children under 7 years of age rubbed with oil of wintergreen the drug was found in the urine within 2 hours in every instance.

Salicylic acid was used by inunction in 5 children under 9 years of age, in all of whom the drug was found in the urine within 3 hours after the inunctions.

Guaiacol was used by inunction in 14 children and 8 adults. In all the children positive reactions were obtained in the urines within 2 hours. In 2 of the younger ones the reaction was obtained within an hour and a half.

Iodin was used by inunction in 6 children and 3 adults, in all of whom a positive reaction in the urine was obtained within 2 hours.

Guaiacol mixed with anhydrous lanolin in the proportion of one dram to the ounce, when administered to young children, as noted in the above experiments, quickly enters the lymphatic circulation and, compassing every part of the body, passes to the beginning of its excretion in the urine within 2 hours. Guaiacol, administered in this manner, is a valuable remedy in certain diseases: (1) When a general or local lymphatic antiseptic is indicated, as in lymphatic tuberculosis and tuberculous peritonitis; (2) in streptococcic and other localized infections of lymphatic tissues, as in nontuberculous enlargements of the lymphatics of the neck and other parts of the body; (3) in pulmonary tuberculosis and in all diseases in which a pulmonary and bronchial antiseptic is indicated, as in the various forms of bronchitis, pneumonia and other diseases of the respiratory tract in infants.

For many years the writer has followed the plan of treating influenza, bronchitis and all the milder affections of the respiratory tract in infants with guaiacol inunctions to the exclusion of almost every other form of medication intended to influence by internal administration local conditions in the lungs or bronchial tubes.

Inunction is a rapid and efficacious way of administering the drug to infants and young children and is an especially valuable method, since it is almost impossible to give it or any of its combinations to infants by mouth without producing more harm than good by upsetting the stomach and interfering with the digestive process. Iodin administered by inunction is of positive value in the treatment of late syphilis, of chronic glandular enlargements, of some acute catarrhal conditions of the bronchial mucous membranes, and as a general alterative in certain forms of chronic malnutrition.

Inunction is also a valuable way of introducing oil of wintergreen into the general circulation of infants and young children. The indications for its use are found in all those conditions in which it is necessary to give the salicylates for their influence upon diseased conditions outside of the intestinal canal. In lumbago, acute and chronic rheumatism, chorea, tonsillitis and endocarditis the salicylates are valuable and in these and other conditions in which the salicylates are indicated as good, if not better, therapeutic results can be obtained in infants by inunction of the oil of wintergreen as by giving the salicylates internally. It is evident that by this method the child is saved from the gastrointestinal disturbances and consequent interference with nutrition which so commonly follow the administration of the drug by mouth.

Colloidal silver within the past few years has been administered hypodermically, by the stomach and by inunction in the treatment of various forms of localized and general septicemia. In the acute enlargement of the lymphatic tissues of the neck which may follow scarlatinal, diphtheritic and other forms of tonsillitis it is believed that this remedy in the form of unguentum Credé, properly rubbed into the surrounding lymphatic tissues, is of very great value in preventing the spread of the disease and in controlling the localized sepsis. This drug can be given more efficaciously to infants and young children by inunction than in any other manner, and its value in combating general and localized sepsis is of much more value in infants than in adults, because inunctions in general are more efficacious in children than in adults.

The Clinical Significance of "Growing Pains" in Children. Attention is again called to "growing pains" in children by an article by W. W. Butterworth,[1] who says it is a popular belief among the laity and with not a few physicians that the normal growth of stature is frequently associated with so-called growing pains. That normal growth in an infant or child is ever a painful condition, is open to serious doubt, and from the pediatrician's point of view should never be considered. It is important and necessary that the true character of these indefinite pains should be ascertained and careful examination almost always discloses

1. Myalgia or fatigue due to overexertion.
2. Pain due to a neurosis of a joint and confined mostly to the large joints.
3. Pain caused by a slight separation of the epiphyses from the shaft and incomplete fractures about the joint.
4. Epiphyseal pains, occurring in malarial and typhoid fevers and during convalescence from infectious fevers.
5. An epiphysitis due to disturbances of nutrition and met with in anemia, lues, rickets and scurvy.
6. The pains of flat-foot, poliomyelitis and hip-joint disease.
7. The epiphyseal and osseous pains of osteomyelitis and tuberculous conditions of bones and joints. These are of especial importance because of the destructive tendency of the lesions.
8. The larger group of indefinite pains, often the only objective symptom of rheumatic fever as it occurs in children.

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(1) New Orleans Med. and Surg. Jour., November, 1908.

In conclusion, the writer reiterates that so-called wandering or growing pains most often indicate the rheumatic state with all its dire possibilities.

Daily Variations in Temperature in Infants. Gofferje[1] has made a study of the temperature in healthy and sick infants. It keeps on a high level plane from 6 a. m. to 6 p. m., with a corresponding low level plane at night, from 10 p. m. to 4 a. m. The temperature should be recorded uniformly at 2 a. m., 10 a. m. and 6 p. m. The difference between the day and night curves is more marked in the older children, but no difference can be detected between breast children and others thriving on artificial food. The temperature in the axilla is that of the muscles and is an index of the innervation of the muscles. From the record of the temperature taken in the axilla it is easy to tell just when the infant awoke, when he lay quietly and when he cried. As the child wakes and grows lively the temperature rises, reaching its height about 10 a. m. The curve drops a little at each nap and rises above the level at each crying spell. Febrile conditions affect the daily variations in three typical ways. The most frequent is that in which the night reduction does not occur at all or occurs tardily and in which occasional peaks rise above the normal diurnal plane. This is the type in dyspeptic disturbances; in severe alimentary intoxication it is most pronounced. The peaks become sharper and more frequent, but there is no difference between the day and night levels, merely the irregular zigzag of the temperature curve amounting to actual delirium temperature in the severest form of intestinal catarrh. This type is also observed in serum diseases. The daily variations are of diagnostic importance. In one case, for example, the projecting peaks and the delay of the night decline were observed the second day after a prophylactic injection of diphtheria antitoxin. Nothing else indicated anything wrong; the child slept quietly, but in a day or two an exanthem developed, the peaks rose higher, and the temperature did not decline in the least at night. The onset of the serum sickness in this case was revealed early by the temperature curve long before it could be otherwise detected.

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(1) Jahrbuch f. Kinderheilkunde, August, 1908.

The second type of changes in the curve in febrile conditions is that in which the temperature line runs night and day horizontally along the day level, or moves in waves with no connection with normal daily variations. This type includes remittent and continuous fevers, and the change from the normal type may occur without the temperature surpassing the physiologic limits. When the temperature curve runs in a horizontal line at the level of the day plane this indicates the onset of a febrile condition. In the writer's experience it was always the premonitor of an infectious affection. He calls it *febris continua sine elevatione.* In the beginning of the research the attendants thought the thermometer incorrect, when the infant was found sleeping quietly at night with a temperature still at day level, although other conditions seemed entirely normal. In a day or so symptoms developed in every such case, showing that the absence of the usual night drop was the result of the incipient morbid process. In estimating the tuberculin reaction, this lack of the nocturnal drop in the temperature must be regarded as the equivalent of fever. The third type of disturbance in the daily variation of temperature is rare; the daily variations persist but are much exaggerated both upward and downward.

Hyperpyrexia in Children. P. Marvel[1] has studied a number of cases of hyperpyrexia in children (see table) and draws the following conclusions:

1. That pyrexia is a complex phenomenon, the result of infection, injury, nervous shock or disturbance, the causal relations of which are far from understood.
2. That hyperpyrexia is merely an aggravated pyrexia and in the presence of certain diseases, like bronchopneumonia, meningeal and pulmonary tuberculosis, pneumonitis or severe injuries to the nervous system, is of grave significance.
3. That the rational use of cold water, properly sustained by artificial and internally stimulating agents, even in the extremely high temperature, may not infrequently be followed by success.
4. That hyperpyrexia in children, though always signi-

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(1) Jour. Am. Med. Assoc., Dec. 5, 1908.

fying grave danger, is not so likely to be accompanied by fatal results as in adults.

Marvel's Case of Hyperpyrexia in Children.

No.	Diseases.	Temperature.	No. of Cases.	Per cent Cured.	Mortality.	Mortality per cent.
1.	Acute articular rheumatism	106	1	100	0	0
2.	Bronchopneumonia	106-106.6	9	45	5	55
3.	Cerebrospinal meningitis	106-108.8	2	0	2	100
4.	Erysipelas	106-106.4	3	100	0	0
5.	Enterocolitis (acute and chronic)	106-107.2	6	50	3	50
6.	Measles	106-106.8	4	100	0	0
7.	Intestinal worms	106-106.8	2	50	1	50
8.	Pyemia	106-107	2	0	2	100
9.	Septicemia	106-106.6	1	100	0	0
10.	Scarlet fever	107	1	0	1	100
11.	Tonsillitis, follicular, one post-pharyngeal abscess	106-106.4	6	83	1	17
12.	Tuberculosis (meningeal)	106-110	5	0	5	100
13.	Tuberculosis (pulmonalis)	106-107.2	2	0	0	100
14.	Variola	106.2	1	100	0	0
			45	Av. 44.4	20	

Hydrotherapy in Children. In an article on hydrotherapy in childhood, F. Grosse[1] advises that the healthy new born infant should be bathed at 97° F., after 4 weeks at 98°, during the third month at 95°, and every month one degree less until 88° is reached. During the second year the temperature should be lowered gradually to 84°, but never below 80°, even for healthy children. During the first 5 or 6 years in poorly nourished children the progress has to be slower. The duration of the bath should be from 3 to 8 and seldom 10 minutes. The strong baby stays in the water longer, the delicate one a shorter time. In the bath the child should be washed during the first year with a sponge, then with a soft linen mitten, later with rougher material.

In the matter of hydrotherapy in fevers there is no doubt that the struggle of the hydrotherapeutists for more than a century has begun to bear fruit. As to the methods, the bath, the wet pack and cold compresses are available. In mild cases of the common infections, as measles, scarlatina, diphtheria or mild diseases, as rubeola or varicella, the cold rub alone is sufficient. The common way is to use

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(1) Archives of Pediatrics, May, 1908.

the half bath, combined with more or less vigorous friction. The younger the child and the milder the malaise, the shorter the bath. It may range from 3 to 12 minutes; in extreme cases longer. Usually 86°to 80° is low enough. After the tub the patient is dried, or better, wrapped in a dry linen sheet (sometimes warmed) and put to bed.

In giving the hot full bath, 107°, either the baby is slowly immersed for 3 minutes without rubbing, or the water is first taken at 100° to 103°, the child put in, and after one minute hot water added up to 107°. During the first year 3 minutes are sufficient; later 4 to 6 minutes should not be exceeded. The bath is highly advisable in pending collapse, for instance, of summer cholera, to promote the appearance of the rash in exanthemata, and last but not least in cerebrospinal meningitis, in which it is repeated many times a day. It may be said that this bath is a wonderful stimulant. Moderate fever is no contraindication, for such a bath is antipyretic.

Next to the tub bath the wet pack should be mentioned. Changed 4 to 6 times during an hour, it may act as a reliable antipyretic. This method is recommended by numerous authors for measles, scarlatina, bronchitis and bronchopneumonia. All wet packs are followed by a cold rub, or better, a half bath.

Finally the cold compress: Linen towels well wrung out of water at about 70° are wrapped around the trunk 3 or 4 times and well covered with a dry permeable material. Impermeable material is positively forbidden. If a cooling effect is desired they should not remain long unchanged. When stimulation is looked for, the general aspect of the patient determines the time of renewal—one to four hours.

The writer also discusses the hydrotherapeutic treatment of certain diseases. In acute rhinitis and all forms of coughs the Balz bath of 107° is an almost sovereign remedy when given 3 times in 36 hours. The child is afterward not dried but loosely wrapped in a dry sheet and put to bed until perspiration ceases. In stenotic conditions of pseudocroup, measles and pertussis it is without doubt of absolute efficacy. In pertussis during the first more feverish days the general treatment is followed, later a bath is given regularly, morning and night, compresses applied over night, and twice a week 3 hot baths are given in 36 hours. The results warrant recommendation.

In nephritis the Balz bath must be recommended again. It can be repeated as often as the case requires, but it must be hot and short.

Provided that there is only a nervous or muscular weakness, a hip bath of 75° to 79° may be given 2 to 3 times a day for 8 or 10 minutes for enuresis nocturna. If the patient is not tractable, he may be accustomed to the procedure by a number of warm hip baths, which are gradually lowered in temperature.

Diseases of the digestive tract offer ample indications for the use of water. In all cases a compress will favor circulation in the deeper parts and cover at the same time a host of minor symptoms. In the management of summer complaints and chronic digestive disturbances there is no other agent always so ready at hand as a half bath. Indeed, there is hardly any doubt that rational frequent bathing is the best prophylactic. And even in a collapse a hot full bath of from 1 to 3 minutes has often proved life saving. Remarks on bathing should not be omitted in the instructions to district doctors for the poor, for they are just as important as the dietetic part.

Whoever devotes a little time to the study of hydrotherapy and keeps in mind that no hydriatic proceeding is possible without thermometer and watch, will soon be convinced that hydrotherapy in childhood cannot be too highly appreciated.

The Exudative Diathesis. Czerny[1] finds that in all instances in which children suffer with the exudative diathesis, parents and other relatives are neuropathic or psychopathic; in fact, he says, children of decidedly nervous parents are rarely free from this constitutional affection, although there is not necessarily a relation between the degree of nervousness in the parent and of the exudative diathesis in the children. Knowledge of this combination is of great practical importance, as a complete cure can be expected only if the treatment is both against the diathesis and the neuropathic tendency. A persistent eczema may be cured by simply removing the child from the family

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(1) Monatschrift f. Kinderheilkunde, 1908, VII, No. 1.

surroundings and placing him where his mental activity can be guided in different grooves; the same is often true of nervous asthma and other nervous affections. Czerny advises against rest cures and medicines, preferring a complete change in the manner of life and education.

The Energy Requirements of Nurslings With a Retarded Development. J. Rosenstern[1] considers this subject and says that premature births, undersized normal infants and infants suffering from an acute enteritis in whom the weight loss is chiefly water and salts are not considered here. The cases referred to are those suffering from lack of body tissue or insufficient increase in body tissue, existing over a period of months and who are not suffering from any disease entity. For these cases Finkelstein laid down the rule that their caloric requirements was that of a normal sized healthy infant of the same age.

This statement was tested as follows: Infants answering that description were fed with a quantity which gave 80 to 100 calories per kilogram body weight daily. The quantity was then increased until gains in weight set in, eliminating all cases that showed intestinal derangement. Numerous cases are cited in detail, all with the same result.

As soon as the caloric value of the food reached approximately 80 per kilogram of what the weight should be for the age the infant began to gain. This gave an average caloric value per kilogram of actual body weight of about 140. Flaws in the reasoning might be:

1. Increased weight might have occurred in the cases without increased food, the delay being due to incomplete recovery from disease, but these infants were healthy and increase in weight came immediately when the calories had reached 65 to 80 per kilogram of ideal body weight.

2. Sufficient water-salt or proteids may have been responsible for the failure to gain, but after a bottle feeding all infants desiring it get saccharin tea *ad libitum,* and since all the food mixtures used contain cow's milk and this contains almost triple the amount of salts and proteids found in breast milk there could have been no lack of any of the above ingredients.

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(1) Deutsche med. Woch., Feb. 18, 1909.

The above determinations do not conflict with the rule of animal nourishment in sick infants since they apply only when infants are merely *underweight but well.*

The explanation of the increased need for nutrition in the development of underweight nurslings lies in the following:

1. The diminished fat and increased or relatively large amount of living and working protoplasm.
2. The increased activity of the older nurslings (greater than that of full weight nurslings of the same age).
3. An increase in oxidations, specific (?) for convalescence.

This is comparable to the findings of Svenson in typhoid convalescents, in whom he found a 50 per cent. increase in oxidative processes over the normal.

Lead Poisoning in Childhood. A. Jefferis Turner[1] states that lead poisoning is not uncommon in children in Queensland, but it is practically unknown in adults not exposed to it by occupation. About 20 cases are treated in the Children's Hospital at Brisbane every year.

He attributes this to the white lead used in the paint on most of the houses. In the summer the paint dries and is reduced to a powder which clings to the hands and is carried to the mouth.

The symptoms are unusual in children and not generally understood. The blue line is generally apparent as small blackish dots, the continuous blue line being very rarely seen. Gastrointestinal attacks of pain and vomiting, regardless of the food ingested, associated with pain in the legs, is very suggestive of lead poisoning. In children, in contradistinction to adults, foot drop is more common than wrist drop. Periodic attacks of blindness are not uncommon, but the children suffering from the ocular trouble rarely have the limb palsy.

The principal point in the treatment is prophylaxis; that is, have no lead paint where children can reach it.

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(1) British Med. Journal, April 10, 1909.

ORTHOPEDIC SURGERY

BY

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WITH THE COLLABORATION OF

A. STEINDLER, M. D.

ORTHOPEDIC SURGERY.

DISEASES OF THE HIP JOINT.

Congenital Dislocation of the Hip. Davis[1] gives the history of the early work with congenital dislocation of the hip as follows:

"The treatment of congenital hip luxations has developed on two separate lines: the non-operative and the operative. It began about 1826 when Dupuytren brought forward his pelvic band. Corsets, jackets, and braces followed. The next advance was about in 1847 when Humbert, and especially Pravaz, of Lyons, advocated traction to bring the hip down and then pushing it over into place. This method was followed in a more or less modified form by Buckminster Brown, Bradford, Mikulicz, Max Schede, and others. While these traction methods were being developed, other surgeons were doing operations for the same condition.

"Guerin was one of the first to cut the muscles subcutaneously; Brodhurst and others followed. Resection of the displaced head was given quite a thorough trial until, finally on January 29, 1888, Alfonzo Poggi, of Bologna, replaced the head in a new acetabulum scooped out of the side of the ilium. Two years afterward the late Prof. Hoffa brought out his well-known method of detaching the muscles about the great trochanter and making a new acetabulum. In 1892 Lorenz modified Hoffa's procedure by making an incision from the anterior superior iliac spine downward and outward along the posterior edge of the tensor fascia femoris muscle. In 1895 Hoffa, having been convinced by Trendelenburg that loosening of the muscles attached to the greater trochanter was unnecessary, made an incision along the anterior edge of the greater

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(1) Amer. Jour. Med. Sciences, January, 1909.

trochanter from its tip down. There have been practically no further developments of the open operative method since that date. While the bloody method was occupying the attention of the surgical world, Agostino Paci, of Pisa, was publishing his work by the bloodless method from 1888 to 1893. In 1894, at the International Congress in Rome, Lorenz and Hoffa came prepared to fight for their respective cutting operations, but Paci by this time had systematized his work. He gave his results on 23 cases of congenital luxations, besides of 5 of pathological and old traumatic ones; also those of 10 other surgeons who had used his method; he submitted a specimen showing a perfect antemortem reposition; and finished by performing his bloodless method on a patient before the assembled surgeons. The effect might almost be described as ludicrous. No more was heard of cutting operations. Lorenz, in the following year, modified Paci's procedure and travelled far and wide exploiting it.

"The majority of congenital luxations of the hip which one now sees can be replaced by the more or less modified bloodless method of Paci, but occasionally one sees a case which it is impossible so to reduce."

Davis goes on to report 3 cases, too old for either the bloodless or the bloody replacement, in which the slipping and pain were so great that relief of some sort was imperative. In these cases he cut down on the femoral head, scooped and bored out a new acetabulum, inserted the femoral head, put the limb up abducted, and obtained stable and painless joints.

[In this connection the Editor wishes to report the result of an operation by Alexander Hugh Ferguson, in a child a year and a half old, without any attempt to replace the congenitally dislocated femoral head by either the bloodless or bloody method. Ferguson cut down on the femoral head in its dislocated position on the dorsum of the ilium, cut a curved flap from the outer table of the ilium and turned it down like a shelf over the top of the femoral head, fastening it there closed the wound. More than 5 years later the child was brought to the Editor. The shortening was no greater—about an inch—than it was said to have been when Ferguson operated; the new joint was secure and there was a good and useful range of motion. This patient has been seen several times during the past 2 years and the result remains the same. An *x*-ray picture shows the condition as described. While the result in one case does not carry conviction it is sufficient to encourage one to try again. RIDLON.]

P. Redard and P. V. Badin[1] recently gave a very thorough description of the bloodless method in congenital hip dislocation. It is by no means always a simple procedure. Considerable difficulty is offered by the shallowness of the socket and the manifold deformities of the head and neck of the femur, as ante- and retroversion. Besides the capsular ligaments (especially Bertini's ligament) retract the capsule, transforming it into a narrow sack, which condition may render reduction extremely difficult. The muscles which mostly oppose the reduction are those of the pelvifemoral group (adductors.) The anterior dislocation is, as a rule, easier to be reduced than the posterior, as in the latter location the changes in the capsule are more extensive.

In the *operative technic* the author distinguishes 6 stages, the first stage being the administration of the anesthetic and the fixation of the pelvis by manual force. The second stage consists in the mobilization and downward traction of the head of the femur. Continuous extension for several weeks prior to the operation is only necessary in very difficult cases with a shortening amounting to 2 or 2½ inches. Extension by special extension apparatus (Lorenz, Schede) should be reserved for cases absolutely refractory to manual extension, which latter is usually sufficient in the younger patients. The third step is the stretching of the muscles. The author takes special pains to do so without impairing their integrity. He never practices tenotomy; likewise he condemns myorrhexis and avoids pressure on the contracted muscles. The lengthening of the adductor muscles is simply obtained by abduction movements, gradually increasing their extent. The elongation of the flexors and extensors of the hip-joint is accomplished by flexion and hyperextension movements. The reduction proper is the next step. The operator flexes the thigh to a right angle, exerting

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(1) Gaz. des Hopitaux, January, 1909.

vigorous traction in this position so as to get the head of the femur behind the socket; then a gradual adduction movement is produced until the thigh is parallel to the table. This maneuver being repeated several times and the abduction being made more and more extensive, one finally succeeds in replacing the head of the femur, which is indicated by the characteristic reduction sound. Sometimes the reduction cannot be obtained except by placing the fist under the trochanter major, which the author does in preference to using the wedge. Widening and modeling of the socket and extension of the capsule constitute the next phase of the operation. The thigh is placed in an abducted and semi-flexed position and rotary movement of the thigh is practiced. The extension of the anterior part of the capsule can be accomplished by hyper-extension. As to the position of immobilization (sixth stage), in the majority of cases abduction and flexion of 90° and indifferent rotation is preferable.

The author advocates performing the operation as soon as practicable. After the seventh year the operation becomes very difficult and even dangerous. Ten years is to be considered as the limit, beyond which we may seldom expect good results.

At the last meeting of the German Orthopedic Society there was a general discussion of the bloody and the bloodless method of treating congenital dislocation of the hip-joint. While it may be true that the bloody method has fewer reluxations, still its end results are less favorable. Three cases of bloody reposition reported by Deutschlaender showed perfect functional results, one of them being in a youth of 17 years with a displacement of 17 inches.

Lorenz, basing his judgment on an experience with 1,000 cases, would venture to use the bloody method only occasionally.

Attention was called again to the axillary abduction by Werndorff in cases of eccentric dislocation.

A very interesting statistical report was furnished by Bade concerning paralysis of the lower extremities following bloodless reduction. Among 2,400 cases this has been observed 97 times or in 4.05 per cent. of the cases. Mostly cases of advanced age were concerned in this complication, emphasizing the necessity on this score for the early operation.

A review of the final results of all the cases operated on by Lorenz by the bloodless method, as related by his assistant, Reiner, shows good results in 40 per cent. of the unilateral cases. The bad results were usually due to reluxation or ankylosis. In the bilateral cases bad results occurred in 50 per cent. Failure of the bloodless method does not necessarily indicate the bloody method. The latter should be limited to cases in which reduction, not retention, is impossible.

In the treatment of congenital dislocation of the hip in older children, according to Froelich,[1] aside from palliative methods, as corsets, subtrochanteric osteotomy, bloodless forcible abduction of Lorenz, the Lorenz reduction method, combined with previous extension has to be taken into consideration. Froelich never exceeds a traction of 50 pounds and this for not more than 2 months. He has treated in this way 10 children, of 9 to 14 years. Twice paralysis of the sciatic nerve was noticed. In spite of using extension reduction proved impossible 3 times, and twice reluxation occurred.

The period of fixation extends over 6 to 8 weeks only. Notwithstanding this short fixation period ankylosis followed in 3 cases.

In considering the operation it is not so much the age of the patient as the position of the head of the femur that is to be taken into account. The reduction should only be attempted when the trochanter does not rise above Nélaton's line to exceed 3 cm., and if the musculature is weak and the head of the femur is not too firmly fixed, so that it may readily follow the extension.

Among the untoward after effects of the Lorenz bloodless method the most dreaded is the paralysis, especially of the sciatic nerve. Peltesohn[2] lately devoted special attention to this complication although Toachimsthal, under whom he works, has not seen paralysis of the sciatic nerve occur in one of his 300 cases. The paralysis may concern the whole sciatic trunk or only the peroneal branch and is

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(1) Rev. d'orth., No. 1, 1909.
(2) Zeit. f. orth. Chir., XIII, 1909.

characterized in the latter instance by the well known front-foot-drop.

Concerning the origin of the paralysis, traction and contusion of the nerve are considered of importance. According to Lorenz extension applied prior to the operation prevents both traction paralysis and neuralgia. Naroth, on the other hand, asserts that in all his cases of paralysis the Lorenz screw had been used. Zocht and Bade also found paralysis of the anterior tibial nerve in spite of preliminary extension. Peltesohn thinks that in some cases of considerable shortening the paralysis is due to traction, while in other cases in which the head of the femur passes over the posterior part of the rim of the acetabulum in the act of reduction a crushing of the nerve between the head and the socket may occur.

In regard to the treatment, it is not advisable to leave the plaster cast whenever the diagnosis has been ascertained, as the chances for recovery are much better if the cast is removed. Several cases have been reported in which the bladder and the rectum were involved in the paralysis. Here the treatment will have to be carried out along the usual lines for peripheral palsies, *i. e.*, chiefly massage, bathing and electricity.

Conservative Treatment. Many orthopedic surgeons, in opposition to the attitude of former years, are maintaining a strict conservatism in the treatment of hip-disease. Koenig[1] does not agree with this latter extreme, pointing out the number of permanent abscesses and sinuses under conservative treatment. This author, who wrote the most important monograph on tuberculosis of bones and joints that has ever been written, cites 760 cases of resection of the hip-joint performed between 1876 and 1895 and which were reported in a paper in 1902. He says that it is not surprising that the final results in patients cured without operation are better than those with operation, when we consider the serious nature of the cases which come to operation as compared with those treated conservatively, and also when we consider the gravity of the operation itself. Collapse during the operation was much more frequent during the first decade of the operation when car-

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(1) Berlin klin. Woch., March 8, 1908.

bolic acid and other strong antiseptics were in use. The mortality in connection with this operation is much less nowadays in the era of asepsis.

Bionde[1] proposes a new way of treating hip-disease. In consideration of the many failures of operative and other methods he deemed it wise in advanced cases not to work against the establishment of a pathologic dislocation of the joint, but rather to promote it. He keeps up the mobilization of the hip, however. In this way the author feels that weight-bearing by the head of the femur may be prevented, thus excluding a very serious factor.

Wilson[2] following Lorenz, makes a strong argument in favor of the use of the short plaster spica, reaching only from the knee to the ribs, in the treatment of hip disease; this without recumbency in bed or the use of crutches in walking. His conclusions are as follows:

1. Tuberculosis of the hip requires the advantages of outdoor life and proper diet. Confinement to bed favors atrophy from disuse and in turn lowers the vitality of the patient. Weight-bearing is conducive to the benefits afforded by outdoor life. It prevents circulatory stasis and aids in securing the therapy offered by Bier's hyperemic method, thus increasing the resistive powers of the patient. The gain in weight, with increase in size of the affected extremity, and the general improvement, all point with favor to the spica method.

2. Weight-bearing does not cause bone destruction and pathologic dislocations any more than the extension method; rather the contrary, and usually aids in healing it. It is grinding of the joint surfaces and not weight-bearing that is harmful to these cases.

3. Incipient cases are the most suitable for this form of treatment. This method is not applicable to debilitated cases and those with discharging sinuses, without the temporary use of crutches.

4. The ideal cure is full normal function. The favorable cure is ankylosis in the posture most useful to the patient.

5. The spica method usually shortens the course of

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(1) XXI Congr. Soc. Ital. di Chir., 1908.
(2) Southern Medical Journal, January, 1909.

treatment and prevents the occurrence of ankloysis is an unfavorable posture. The best position for application of the cast is 20 degrees of flexion, 20 degrees of abduction and 5 degrees of external rotation. No material is equal to plaster-of-Paris in obtaining accurate fixation, fitting and adjustment. An additional advantage is that it cannot be removed without the surgeon's knowledge.

6. Abscesses are best treated by the more conservative plan. Open only when there is danger of rupture of same or when the pain is excruciating. Drainage is useless in the treatment of abscesses and only favors sinus formation. Preference should be given to open incision and suture without drainage. Beck's bismuth injection is invaluable in chronic sinus.

In discussing the value of traction in the treatment of hip disease, Bradford and Soutter,[1] divide the present methods into: (1) No mechanical aids, (2) the Thomas splint, (3) plaster of Paris splints, and (4) some method of traction.

The results under the first method are that a large proportion of cases of imperfectly treated hip disease will recover eventually without treatment, but with deformity of greater or less severity; this ensues, in many cases, after years of suffering and the frequent occurrence of abscess and resulting sinuses, and not infrequently sepsis and septic osteomyelitis.

As to the Thomas splint: It furnishes imperfect fixation, it does not prevent increased interarticular pressure, and it does not prevent the development of pathologic dislocation. For larger patients it is an awkward appliance. It necessitates the use of crutches and does not allow the patient to sit with comfort. On the other hand, although some skill is demanded in its adjustment, this is not sufficient to prevent its ready use. It enables the patient to move or to be handled without discomfort except during the most acute stage, it diminishes or prevents flexion deformity and it checks but does not prevent adduction. In double hip disease it is an admirable appliance.

A well-applied plaster-of-Paris spica bandage, reaching from above the mammillary line to below the knee, placing the patient in a portable frame with facilities for being moved about freely, and an abundant supply of fresh air, combine to afford a method of treatment which is satisfactory during the acute stages of the affection, without a demand upon a large nursing force. This is the treatment so successfully conducted at Berck-sur-Mer; but a short spica bandage, combined with crutches, in common use in many clinics as an ambulatory method of treatment of hip disease, cannot be recommended as a thorough method of treatment.

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(1) American Jour. Med. Society, December, 1908.

As to traction, it meets a pathologic indication during the acute stage, that is, it checks undue crowding; that when efficiently applied it furnishes a satisfactory measure of fixation of the joint and that when traction is employed better results are obtained than when it is not made use of during the course of treatment of hip disease.

It is most interesting to follow cases of double hip disease and see the final results. Guillaume-Louis and Calve[1] point out the frequency of pathologic dislocation. The prognosis is doubtful. Among 23 cases treated in the Hôpital Maratime of Berck-sur-Mer 8 died from tubercular meningitis and septicemia. The final result may be: (1) Double-sided ankylosis in good position, legs being of equal length; (2) double-sided pathologic dislocation with equal length of legs; (3) double-sided dislocation with flexion and adduction deformity; (4) double-sided ankylotic adduction deformity; (5) asymmetrical position of extremities; (6) double-sided ankylosis with pronounced outward rotation. Considering function, the children with double-sided dislocation with ankylosis show the best walking. As far as the correction of the deformities is concerned, it has to follow the principle of establishing a parallelism of the legs in the first place, and the creation of some mobility in one or both legs.

Coxa Vara. As an early symptom Orthlagh[2] found coxa vara in osteomalacia. The condition was characterized by considerable restriction of abduction. The author is satisfied that coxa vara symptoms are prevalent in osteomalacia at a very early stage, caused by the influence of weight-bearing, without structural changes of the epiphysis necessarily occurring.

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(1) Gaz. des Hôpitaux, 1908, p. 1,479.
(2) Wiener klin. Rundschau, 33, 1909.

The changes in the anatomic structure of the socket in cases of coxa vara has been made the subject of *x*-ray studies by Savins-Castano.[1] Besides the characteristic change of the angle of the neck of the femur the author found thickening of the V-shaped cartilage, shallowness of the acetabulum and asymmetrical formation of the pelvis. The changes in the roof of the acetabulum consist of a more upright direction of the same, sometimes even assuming a slight degree of convexity.

Injuries of the Neck of the Femur. In discussing injuries of the neck of the femur during early life, Whitman[2] fails to approve of the distinction that has been made between cases that he has called fracture of the neck of the femur and others have called traumatic coxa vara. He would call them all fractures, but would distinguish fractures of the neck due to serious injury and giving immediate disability from separation of the head at the epiphyseal line having a gradual onset and not giving at any time a complete disability.

An injury to the hip in a healthy subject resulting in immediate disability and presenting the physical signs of fracture, whether in childhood or adolescence, is far more likely to be a fracture of the neck than at the epiphyseal junction. In the first ten years of life the injury is almost certainly of the neck. In adolescence it is probably at this point. If, on the other hand, the subject is an adolescent, particularly of the weak, rapidly growing or over-weighted type; if the symptoms were induced by comparatively slight injury; if the disability was not complete, but slowly progressive, the probability is that the lesion is an incomplete epiphyseal fracture. For if the separation is immediate and complete the injury is usually more severe, involving leverage of the limb upon the head, and the disability is correspondingly greater.

In the cases of fracture of the neck, after the primary pain and weakness have lessened, the patient begins to walk about and later is brought for treatment because of a per-

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(1) Zeit. f. orth. Chir., XXIII, 1 and 2, 1909.
(2) Medical Record, Jan. 2. 1909.

sistent limp, usually accompanied by a slight discomfort. The physical signs, aside from the limp, are an inch or less of shortening, prominence and elevation of the trochanter and slight outward rotation of the limb. Motion is practically free except in abduction, which is restricted in accordance with the degree of depression of the neck.

If one has an opportunity to treat the patient before consolidation is advanced, the limb should, under traction and by carefully applied force, be placed and fixed in complete abduction for the purpose of reducing the deformity, in the manner that has so often been described. If, however, as in most instances, repair has taken place, a sufficient wedge of bone should be removed from the base of the trochanter to restore the angle of the neck and thus the range of abduction which is dependent upon it.

The characteristic cases of epiphyseal fracture are in adolescents. The injury is comparatively slight, so slight, it may be, as to pass unnoticed. The disability is not immediate nor complete, but the symptoms become progressively more disabling during the time that in fracture is the period of repair. Motion becomes more limited, until, in many instances, there is practical fixation at the joint. The reason is evident. In fracture of the neck of the femur the joint is not directly involved; in epiphyseal fracture it is, thus movements are restricted by the irregularities of the opposing surfaces and by the muscular spasm that is symptomatic of all joint injuries and diseases. In fracture of the neck the history and physical signs point directly to injury and consequent deformity, whereas in epiphyseal fracture the superficial indications are often those of disease.

Operation.—An incision about 5 inches in length is made downward from just outside the anterior superior spine in the line between the tensor vaginæ femoris and the gluteus medius muscles. When these are separated the anterior surface of the joint is exposed and is opened by a straight incision in the line of the neck. The extremity of the neck is at once brought into view, but the head is almost completely concealed, lying below and behind it. Thus the removal of a thin section of bone is often necessary to permit the inserion of a chisel with which the fragments must be pried apart to permit replacement by abduction and inward rotation of the shaft. In most instances they are adherent, as if the fracture were incomplete, or as if there were partial repair. The periosteum on the posterior surface appears to be uninjured, and when the parts are brought into normal relation with one another, the tension is sufficient to hold them firmly, the head following the movements of the neck in a normal manner. The wound is closed in layers, and drainage is not essential. A plaster spica bandage is applied to hold the limb in moderate abduction and in the attitude that most perfectly opposes the fragments, usually extension and inward rotation. The patient often begins to walk about at the end of 2 or 3 weeks. The plaster support is usually retained for about 2 months. Crutches are used for several weeks longer, but as the structure and angle of the neck are normal, weight may be supported much earlier than if the small part of the neck were weakened. Massage of the atrophied muscles, active and passive movements, are valuable aids in restoring function. Of course in early cases, it may be possible to effect reasonable replacement by manipulation sufficiently forceful to disengage the fragments: the limb being then put up in full abduction. On the other hand in very old cases where union has become very firm it may be better to do a subtrochanteric osteotomy to correct the deformity and restore the angle between neck and shaft than to attempt to do this by opening the joint and attempting to separate at the point of union.

Snapping Hip. Zur Verth[1] calls a voluntarily snapping hip the phenomenon of the tractus cristo femoralis sliding over the major trochanter and causing a snapping sound. Many persons show this symptom without having any trouble with the hip. A habitual snapping hip, however, is caused by diseases of the tractus cristo femoralis and the respective bursa, or else by paralysis, rupture or chronic diseases of the gluteus maximus.

In certain movements, without the patient intending it, a part of the so-called Maisiat's stripe, the tractus cristo femoralis, glides over the trochanter major, causing an

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(1) Zeit. f.. Chir., Bd. 98, H. 1.

audible and palpable snapping motion. There is considerable pain and often operative treatment becomes necessary.

Luxatio and subluxatio femoris might be thought of under these conditons, but the *x*-ray will lead to the right diagnosis, showing the exact position of the head of the femur.

Fracture of the Neck of the Femur. Forbes[1] reviews the method of treatment (non-operative) that may be found in most of the text books on fractures, but ignores most of the other writings on the subject except those of Maxwell and Ruth, and of Whitman. He is of the opinion that the division of these fractures into intracapsular and extracapsular has no just anatomic foundation, since the anterior part of the capsule is attached to the shaft at the inter-trochanteric line while the posterior fibers fall short of this line. He divides the fractures into lateral and medial, and is of the opinion that the nearer the fracture is to the head the less likely it is to heal by bony union.

He seems, from his reading and his study of the anatomy of the hip-joint, to admit that bony union *may* take place when the fracture is in any part of the femoral neck, though such union is not the rule, and that more depends upon coaptation of the fragments, and retention in this position than upon the location of the fracture.

In other words the result depends mainly upon the efficiency of the treatment, though he does not say so in so many words. He quotes extensively from the writings of Ruth without apparently having given those writings the critical analysis that has been given them by others. He accepts the assertion of Maxwell and Ruth that lateral traction is not only a mechanical possibility but of proved efficiency in the treatment of these cases. Whereas lateral traction in the treatment of fractures of the femoral neck is a mechanical absurdity, and Maxwell and Ruth have not demonstrated in any case that it has exerted any influence other than as slight additional fixation in those cases that are being treated *per se* by traction instead of by fixation. It is, of course, admitted that Maxwell and Ruth have had some good results, as have many others in impacted fractures, but this often occurs where there is no treatment be-

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(1) Am. Jour. Orth. Surg., February, 1909.

yond recumbency. For in spite of all that they have no doubt honestly thought and said about results in noninfected cases, all the good results that they have pictured are evidently cases of fracture at the junction of the neck with the shaft, and also impacted. It is much easier for any man to be mistaken in his diagnosis of the exact location of the fracture in the neck of the femur, particularly if he has no good *x*-ray picture, than for a mechanical impossibility to happen.

In discussing Whitman's method of putting the limb up in abduction in a plaster spica, he has overlooked Ridlon's amplification or perfection of this method, namely, the use of a powerful traction machine which will not only stretch the leg to its full length (which can not be done by hand as Whitman recommends), but will hold it there until the plaster spica has been applied and has "set." In any case where an anesthetic can be safely given Ridlon's method may be used not only to the end of obtaining a perfect anatomical result, but the patient can be completely relieved from all pain subsequent to the anesthetic and can be gotten up on crutches on the fifteenth day or earlier.

DISEASES OF THE SPINE.

Pott's Disease. Lovett[1] makes a strong plea for the treatment of all cases of tuberculosis of the spine by recumbency, particularly during the active stage and so long as any complications, abscesses and paralysis are present. And he finally favors a plaster jacket to a brace for treatment during the ambulatory period. But by plaster jacket he does not mean the conventional one, put on during partial suspension and reaching only to, or not much above, the seat of disease. He means a plaster jacket put on with the spine fully hyperextended at the area of disease; in all cases including the shoulders, and when the disease is at or above the mid-dorsal region, also including the head. In many cases the jacket is cut away in front and graduated pressure made forward through a trap-

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(1) Cleveland Med. Jour., February, 1909.

door at the kyphosis after the method of Calot. He summarizes as follows:

1. Spinal tuberculosis is a very much more amenable affection under efficient modern treatment than it formerly was. The death rate is far lower, abscesses and paralysis are much less frequently seen, the deformity should decrease and not increase during treatment, and the prognosis is not unfavorable.

2. Outdoor life day and night is essential to stimulate the process of repair.

3. Recumbency fulfills the mechanical demands by removing wholly superincumbent weight, making fixation easy and not constricting the chest. Jackets and braces add to the efficiency of treatment by recumbency. Ambulatory jackets and braces fulfill but imperfectly the mechanical demands and must be recognized as means of treatment during the acute stage, secondary in efficiency to recumbency. Jackets and braces have their place in the treatment of all cases as soon as the acute stage is over and must in many instances constitute the sole treatment on account of circumstances of the patients.

Wassiliew[1] relates his experience concerning the operative treatment of paraplegia in tuberculous spondylitis. Of 5 patients thus affected, in which the prevertebral space was opened, 4 recovered. Death occurred in only 1 case following laminectomy. The after treatment is both general and local. A drainage tube is inserted in the prevertebral abscess and tincture of iodin, iodoform, etc., are injected. Wassiliew considers costotransversectomy as the proper operation for most of the cases of paraplegia of the dorsal part.

The cases are most favorable in which a peripachymeningitis has not yet developed. Unfavorable results are to be expected in cases of steady structural changes of the spinal cord which are already permanently established and causing pressure. In these cases laminectomy is indicated and also is advisable in cases of paraplegia due to tuberculosis of the arches of the vertebræ.

A case of Pott's disease, complicated by lumbar hernia,

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(1) Archiv f. klin. Chir., Bd. 88, No. 3.

is reported by Sahl.[1] The route for these ruptures is previously formed by congestion abscesses. The hernia is found most frequently within the insertion of the latissimus dorsi. The lumbar abscess does not necessarily follow the line of least resistance, nor is every lumbar abscess followed by hernia; but the latter, if existing, follows the road of the abscess.

Scoliosis. It is well known that Schanz[2] considers scoliosis as the expression of what he calls insufficiency of the spine in analogy to the insufficiency of the arch of the foot in flat-foot. He paid special attention to the symptom of pressure pain of the spine, finding it present in the vast majority of cases. In many of the patients who complained of pain in the back he found sensitiveness on pressing or tapping the spine. These cases, as the author thinks, throw some light on the fact that many scoliotics do not stand gymnasium treatment well. The symptoms following pressure pain also indicate the progress of the disease. Scolioses which have become stationary never show this symptom.

As the rotation of the vertebræ is the predominant feature of scoliosis, the treatment should be directed mainly toward detorsion. A contrivance devised by T. Gourdon[3] to accomplish this consists mainly of a number of straps placed around the pelvis and the costal prominences and acting in such a manner as to give the twisted body a rotary turn in the opposite direction. The advantages of this apparatus consist of the possibility of obtaining a rotary correction besides the redressment of the lateral deviation. The displacement of the thorax and the flattening of one side and the projecting of the opposite side are corrected by means of traction, thus influencing the rotation of the dorsal vertebræ. In lumbar scoliosis a correction of the inclined pelvis is produced at the same time. The correcting force may be made as much as 20 to 70 kg. without inconvenience. Owing to the simplicity of the readjustment of the straps the apparatus may easily be applied to all cases of dorsal and lumbar scoliosis.

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(1) Wiener klin. Woch., No. 1, 1909.
(2) Berliner klin. Woch., No. 43, 1908.
(3) Jour. de Med., de Bordeaux, 41, 1909.

In the endeavor to get the attention of the authorities, Bosse[1] quotes the statistics of Hoffa, Deitrich and others, showing the enormous percentage of scoliosis in Germany. The most important and most practical side of this disease is the question of prophylaxis. The author feels that children with simple faulty attitude and beginning scoliosis should be picked out carefully by competent school physicians and given 1½ to 2 hours daily of exercises and massage. Advanced cases should always be treated in orthopedic institutions. Constitutional conditions which may cause or promote the affection of the spine should be given due consideration in the general treatment.

Scoliosis due to congenital malformation is much more frequent, according to P. Desfosses,[2] than is generally assumed. More than 12 years ago Bonnaire pointed out the pelvic origin of lateral deviations of the spine. Among the anomalies mentioned by the author as causes of congenital lumbar scoliosis is the fact that the first sacral vertebra does not unite with the os sacrum, so that the latter counts only 4 vertebræ, similar to the condition in the fetus. On the other hand, the upward movement of the pelvis undergoes an exaggeration; the last lumbar vertebra unites with the sacrum, resulting in 6 sacral vertebræ; there is a double promontory and 5 true sacral vertebræ. The first coccygeal vertebra may unite with the sacrum. There may be an unequal development of the two sides of the sacrum, 4 vertebræ on one side, 3 on the other. Finally the "sacralization" of the lower spine may be associated with premature ankylosis of the os sacrum with the ilium, thus forming the Naegelé type of obliquely contracted pelvis.

An interesting case of scoliosis was recently demonstrated by Princeteau.[3] There was a considerable right lateral deviation and a deep concavity on the left side from the axilla downward. During forced expiration the left lung formed a hernia-like prominence in the sixth intercostal space. The space was considerably enlarged, as it occupied the room of 2 ribs and their intercostal spaces. There were only 11 ribs present on the left side.

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(1) Berliner klin. Woch., I. 4, 1909.
(2) Presse Med., May 8, 1909.
(3) Jour. de Med. de Bordeaux, No. 4, 1909.

The observations of Desfosses[1] regarding the deformities of the pelvis in scoliosis show a resemblance to the oblique pelvis of the obstetrician. These deformities are characterized by asymmetry, flatness and atrophy of one of the iliac bones. It is very likely that a great number of the pathologic forms of the pelvis are caused by scoliosis. On the other hand, it is possible that abnormality of the caudal end of the vertebral column causes asymmetrical development of the pelvis on one side and lateral deviation of the spine on the other. It is frequently the case that the lumbar scoliosis of young girls is discovered by the parents at the time of beginning adolescence, when the female pelvis starts to assume its characteristic width.

Feiss[2] recommends a new form of brace for scoliosis. It is of very simple construction, consisting of a rather broad band of sheet steel passing from the region of the anterior superior spine of the ilium on the side of the concavity of the curvature around the back to near the other spine, the band being padded and completed with a strap. From this steel band two uprights rise to near the armpit but do not support it. The uprights are curved away from the concavity, so that when a broad webbing band is passed around the uprights and the patient at the level of the middle of the curvature and buckled fast, the spine and body are pulled over against the uprights in a way to correct the deformity. Inasmuch as the uprights do not rise high enough to support the shoulder, it is obvious that the brace can be used effectively only when the middle of the curvature is about midway between the level of the anterior iliac spine and the armpit, whereas as a matter of fact in most cases the middle of the primary curvature is as high as the armpit.

DISEASES OF THE SACROILIAC JOINT.

Sacroiliac Disease. Stida[3] calls attention to Trendelenburg's symptom which he found present in sacroiliac disease. Spitzy explains this occurrence by the pain which is

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(1) Presse Med., Aug. 15, 1908.
(2) Am. Jour. Orth. Surg., February, 1909.
(3) Berliner klin. Woch., II. 8, 1909.

caused by movements of the joint. The contracture of the gluteal musculature of the other side not only elevates the pelvis but also presses the os sacrum against the os ilii, causing violent pain; the affected side of the pelvis is dropped in order to avoid these pains. Concerning the treatment, Sayre's plaster-of-Paris corset and Lorenz' ambulatory cast have been recommended, but these contrivances do not seem to comply with the requirement of placing the affected joint at absolute rest. This is possible only in an apparatus which thoroughly excludes weight-bearing by means of a stirrup such as is used in cases of hip disease. It seems more advisable to obtain the rest for the joint by bed rest or plaster-of-Paris bed. Abundant nourishment and outdoor life will aid the treatment considerably.

Slipping Sacroiliac Joints. Fitch[1] reviews the work of Goldthwait and Osgood on this little understood condition and reports 2 cases. His conclusions are:

Strains of the sacroiliac joints are common. Such strains are the commonest cause of sciatic pain in the lower back. Tenderness over the sacroiliac joint and an increase of pain from flexion of the thigh, with the knee extended, are the most important diagnostic points. The normal curve of the lumbar spine must be restored whenever it has been altered. The pelvis must be supported by pressure applied at least as low down as the great trochanters.

[In commenting on this paper the Editor would call attention to the fact that, although practically all American orthopedic surgeons have been keenly on the watch for these slipped sacroiliac joints for the past two or three years, practically no one except Goldthwait and his partners, and now Dr. Fitch, has been able to find any, though they find many such cases. To be sure, we all find plenty of cases that give the symptoms that are supposed to be diagnostic of slipped sacroiliac joints, but we do not find slipped sacroiliac joints, or, at any rate, we are not able to diagnosticate the displacement by the *x*-ray picture any more frequently than we are able with the *x*-ray picture to show the partially dislocated vertebra that is so very frequently found by our friend the "osteopath."

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(1) **Am. Jour. Orth. Surg., May, 1909.**

In the hands of most of us the patient with the classical symptoms of slipped sacroiliac joint recover without operation under the usual treatment for sciatica and lumbago, or by blisters, cautery, vibratory massage and braces, just as he usually does in about the same time without any treatment at all.—Ridlon.]

DISEASES OF THE KNEE-JOINT.

Genu Vaglum. A new method of operating on knock-knee is being recommended by Galeazzi.[1] It consists of (1) plastic lengthening of a part of the biceps tendon in order to adapt the outer ligaments to the conditons of correction; (2) the remaining part of the tendon being transplanted; (3) the tendons on the outer side of the knee are cut through, leaving the capsule intact. After these preparatory plastic operations the redressment proper is done.

Genu Recurvatum. Gayet[2] reports a case of genu recurvatum with subluxation of the tibia, following an insignificant traumatism. It seems that premature and incomplete ossification plays a part in this disease. The femur not encountering any resistance, glides forward and downward under the influence of weight-bearing.

Regarding the treatment, all that is possible is to protect the knee-joint by means of a suitable apparatus.

Excision of the Knee Joint. Rugh,[3] in discussing the question of when bony union is complete after excision of the knee, reviews the important literature on the subject and concludes as follows:

Writers and operators differ as to the length of time fixation or retention apparatus should be worn after excision.

Flexion deformity is much more likely to occur before 12 years of age, when union is fibrous or cartilaginous.

Bony union is more probable after this period by reason of the increased activity of the osteogenic tissue in the part.

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(1) V. Italian Orthop. Congress.
(2) Lyon Med., II. 21, 1909.
(3) Am. Jour. Orth. Surg., February, 1909.

Deposit of bone normally takes place more slowly in the epiphysis, because of the histologic structure of the part.

Intrinsic influences, such as altered states of the health, blood and functional changes may and do retard the process of healing after operation.

Extrinsic factors, such as incomplete fixation, imperfect coaptation, excessive destruction of periosteum, interference with blood supply, cavities, sinuses and infiltration of the surrounding parts, also delay ultimate bony union.

As bony union after fracture of the shaft of a long bone is not complete for from nine months to a year, it will require nearly as much more time for completion in the epiphysis, because of the structure and intrinsic and extrinsic factors.

That during operation sufficient periosteum should be preserved to entirely cover over the line of contact of the excised parts, and that accurate coaptation and as nearly absolute fixation of the bone ends as possible should be secured.

That fixation should be maintained for a period of at least a year, and probably to five years, after excision to avoid the danger of flexion and other deformity.

Knee Derangements. Considering troublesome knees in which no distinct pathologic entity can be diagnosticated, Silver[1] calls attention to the influence of abnormal foot postures as a cause of knee derangements. Seven illustrative cases are cited and he reaches the following conclusions:

1. The production of symptoms at the knee by abnormal foot posture is easily explained by mechanical laws.
2. Pain in or around the knee may exist unassociated with pain in the foot.
3. Strain at the knee from abnormal foot posture may, if unrelieved, produce actual joint changes.
4. Such strain may also be a potent factor in keeping up disability of the knee-joint due primarily to other causes.
5. In all cases of primary knee-joint diseases apparent defects of the foot should be corrected, and in resistant

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(1) **Am. Jour. Med. Sci., November, 1908.**

cases, especially old traumatisms, even when no apparent defect is present, the transference of the weight to the outer border of the foot is recommended.

Stiff Knees. Little,[1] for purposes of treatment, divides these cases into three classes:

1. When there is a good deal of movement and no tendons are felt resisting correction, forcible correction of the deformity or gradual correction by splints may be tried before resorting to severer measures.

2. If no movement is possible, an *x*-ray picture should be taken. If this shows that the ankylosis is bony, anterior arthrectomy should be performed at once.

3. Should the skiagram negative this diagnosis, the method to be followed will depend on the result of an examination under an anesthetic. If the ankylosis is not obviously bony, forcible manipulation is attempted. If this fails, but the tendons and fascia in the ham and at the sides of the joint appear to resist correction, these should be divided. Should it still be impossible to correct the deformity and should there not be enough mobility to be worth considering, an anterior operation should be performed as soon as the wound in the ham has firmly healed.

If, on the other hand, it is desirable to preserve the movable joint such as it is, osteotomy of the shaft of the femur just above the condyles offers the best prospect of success.

DISEASES OF THE ANKLE AND THE FOOT.

Sprained Ankle. Sheahan[2] says the first indication in treatment is clearly to check the extravasation of blood into the joint and surrounding tissues.

The second is to promote absorption of blood already effused.

The third is to obtain satisfactory healing of the injured ligaments and to restore the movements of the joint to their normal range.

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(1) Am. Jour. Orth. Surg., February, 1909.
(2) Dominion Med. Monthly, September, 1908.

To meet the indications mentioned the ankle should be placed at rest, with pressure and cold applications at first; then massage and passive motion for a variable time, depending upon the extent of the injury, and in severe cases fixation in a splint, followed by the application of an adhesive plaster dressing. In the mild sprains the adhesive plaster dressing is applied at once. The patient is allowed to walk some on the foot within the limits of pain.

The method of strapping is that of Cotterel of London.

The leg is first washed and shaved. For a sprain about the external malleolus the foot is held at a right angle and slightly everted. A strip of rubber plaster 12 inches long and 1 inch wide is applied, beginning at the outer side of the foot near the little toe and ending on the inner side of the foot about its middle, just under the plantar arch. The second strip is applied vertically and passes from about the junction of the middle with the lower third of the leg, down alongside the tendo Achillis, under the heel and terminating at a point just above the internal malleolus but posterior to this.

The remaining strips are applied in the same way, each overlapping the other about one-half, until the malleolus and side of the foot up to the middle third of the leg is covered. It is well to reinforce just under the malleolus by strips passing crosswise, so as to give additional support to the part sprained.

The ankle is not completely encircled, so there can be no constriction. The dressing is applied in a corresponding manner for sprain about the internal malleolus.

Over the ankle thus strapped a cheese-cloth bandage is applied, which insures the adhesion of the plaster.

Tarsalgia. In treating the tarsalgia pains in Lang's clinic a simple leather bandage is used, as described lately by Hohmann.[1] As compared with Lehr's adhesive plaster bandage, it has the advantage of lasting longer and being more comfortable. It is constructed in such a manner as to pull up the broken-down transverse arch by exerting traction in a special direction. Thus the pain produced by the broken-down arch is alleviated.

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(1) Zentralbl. chir. u. mech. Orthop., No. 1, 1909.

Metatarsalgia. Allison[1] has devised a new form of support, which is described as follows:

It is made on a cast of the foot which is taken as high on the dorsum and sides as the mediotarsal joint. Under the anterior arch of this cast a depression is cut, deep or shallow, circular or elliptical, to suit the individual case. This depression should have its greatest point of concavity behind the location of the heads of the second and third metatarsals, and should be so cut that it approximately restores the normal relationship of the metatarsal bones. Into this depression the leather worker fits either a hard leather or a compact felt pad and this he sews to a circular leather bandage which is made of light nonstretchable leather, the dimensions of which are marked out by the surgeon on the cast of the foot. It will be found that the slight hallux valgus which exists in most cases will aid in keeping this pad and bandage from slipping backward, as the leather is made to closely fit the shape of the foot at the head of the first metatarsal. The bandage is laced together through holes cut in the two edges over the dorsum of the foot with a light string. No eyelets should be placed in these holes and the leather of the bandage should be soft and of the variety that will not crease.

Club-foot. The early redressment of congenital club-foot is considered by Haglund[2] to be very advantageous, though there are certain difficulties in children of the first year. It is important to make the after-treatment simple, so that it may be placed in the hands of the mother or the nurse. The redressment is performed at the age of 1½ to 6 months and until the foot can be brought into over-correction without any force whatsoever. It is then fixed with adhesive plaster until replaced by a suitable brace. He also uses a plaster of Paris splint adapted to the inner side of the foot and leg, which easily keeps the foot in over-correction and prevents the slipping upward of the heel. As soon as the patient starts to walk, shoes are made of strong leather, to which the well-known Heusner's spiral springs are attached.

Heimannsberg[3] gives a description of the Schultze

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(1) Boston Med. and Surg. Jour., Feb. 25, 1909.
(2) Archiv f. Orthop., VII. 2, 3.
(3) Archiv f. Orthop., VII. 2, 3.

method of the redressment forcé in congenital club-foot of children and adults. He most emphatically opposes the bloody operation for congenital club-foot from his experience with the bloodless methods. He even goes farther than Vulpius, condemning the primary bloody operation without trying it, asserting that the Schultze osteoclast never admits of failure of the method, and saying that the bloody method should be abandoned entirely.

Frankel[1] managed to accomplish a gradual elastic redressment of congenital club-foot, applying correction traction in pronation and abduction. The elasticity of these adhesive plaster tractions is secured by a Heusner spiral spring. The atrophy following plaster casts is thus avoided and the action of a continuous correcting force is secured. Preparatory hyperemic treatment to accomplish softening of the tissues is advisable. In simplicity, harmlessness and efficiency this is a model method of treating club-foot.

Willens[2] gives a method of treating pes equinovarus by tarsectomy, consisting in an ovoid excision of the skin, complete ablation of the astragalus, particularly its trochlear surface, and finally the replacement for the astragalus in the tibiofibular articulation of the cuboid or the extremity of the fifth metatarsal bone in cases in which it is necessary to sacrifice the cuboid also. The operation corrects the equinus by removal of the astragalus, the inversion by the complete raising of the external border and especially the adduction of the toes by the great shortening of the external border which is brought about by a partial resection of the calcaneum and the displacement backward of the cuboid. After these somewhat extensive excisions the elements of the foot adapt themselves to their new topography. A false joint between the cuboid and the tibia is formed which gives to the foot all needed elasticity. Except in younger children the author always performs this method of tarsectomy which is easily done owing to the cartilaginous condition of the bones.

The advantages of the method are the possibility of securing perfect correction, the harmless nature of the opera-

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(1) Deutsche med. Woch., December, 1908.
(2) British Med. Journal, Oct. 3, 1908.

tion, the simplicity of the after treatment and especially the excellent functional results observed after a long interval. The much feared arrest of growth does not prove to be as severe as it is claimed to be and it by no means interferes with the functional result.

Menière[1] gives a new method for enucleation of the tarsal bones in treating congenital club-foot. A blunt instrument is introduced into the bone through a small incision and the whole interior of the bone is evacuated. The astragalus, os calcis and cuneiform bones are treated in this way, then tenotomy of the tendo Achillis is performed. The bloodless correction of the deformity finally follows. In older children the evisceration of the bones is done openly.

A rubber insole built accurately after the plaster-of-Paris positive is recommended by H. Bardach.[2] These insoles are made of vulcanized rubber, embracing the whole breadth of the sole, and are lined with a leather insole. This elastic support is very useful for a sensitive foot provided the insole reaches far enough forward and also embraces the outer border of the calcaneum. Besides turning the foot out of the valgus position the insole favors remarkably the activity of the musculature.

In an article devoted to the treatment of deformities of the foot by means of Bier's suction apparatus, James Fraenkel[3] reminds us of the fact that this method, though technically accomplishing considerable in Klapp's hands, can not as yet hold its place with the Thomas wrench and the Lorenz and other redressing contrivances. The correction of the foot is accomplished in an airtight box furnished with a glass window on one side and connected with a suction air pump. By means of a cord attached to the foot and running in certain directions over pulleys the redressment is brought about under the influence of the passive hyperemia. The method in the first place loosens the articular connections of the bones. Rotary traction which will at the same time produce adduction and abduction is very essential in the correction of club-

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(1) Arch. prov. de Chir., 12, 729.
(2) Wr. klin. Rundschau, No. 39, 1908.
(3) Deutsche med. Woch., No. 42, 1908.

foot deformity. Even in very difficult cases the correction can be performed without an anesthetic owing to the soothing action of the hyperemia. As a preparatory means to the correction the hyperemia is very useful in combination with the hot air box as tearing of the skin and supremalleolar fractures never occur.

Lodivilla some time ago tried to facilitate correction of these deformities by previous congestion hyperemia, which, however, does not seem as practicable as the suction treatment. The main advantages of the hyperemia treatment are first of all the fact that an anesthetic becomes unnecessary even in the most severe cases; the tiresome manual redressment is replaced by the automatic action of the redressing apparatus; the softening of the bones produces a quicker transformation of their structure.

Flat-Foot. According to Gaugele,[1] overloading is the cause of the formation of flat-foot, which in turn causes muscular insufficiency. This condition as well as the abnormal plantar flexion of the metatarsal bones is brought about by improper shoes. These symptoms may disappear immediately if a proper insole is used preventing plantar flexion of the metatarsus.

Schanz[2] devotes his attention to the treatment of the metatarsal pain. If it is true that the breakdown of the transverse arch is the cause of this disturbance, then the reëstablishment of the arch ought to stop these pains. In fact, the author succeeds in this by (1) applying a strap of adhesive plaster running from the back of the foot down to the little toe, then crossing the plantar surface and reaching the dorsum again over the big toe. (2) Besides this bandage an insole is used with the special purpose of supporting the transverse arch. This is accomplished by a steel-leather flat-foot insole similar to Lovett's, to which a transverse strap is attached in the middle of the sole. The contrivance does splendid work in these cases.

Muscat,[3] after giving a description of the clinical features, devotes considerable study to the treatment, mentioning two points of special interest. The first is the use of hyperemia in order to soften the tissues of the foot in cases of contracted flat-foot. He sometimes succeeds sufficiently at one sitting to make the application of redressment measures practicable. Among these the author highly recommends the adhesive plaster bandage which embraces the sole from the inside, pulling the arch upward and ending in circular turns on the leg. The bandage alleviates the pain, turns the foot in pronation and prevents the outward rotation of the foot.

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(1) Archiv f. Orthop., VII. 2, 3.
(2) Deutsche med. Woch., I., 14, 1909.
(3) Klin Chir. Woch., Nov. 16, 1908.

Painful Feet. Wilson and Muschlitz[1] review the condition of painful feet of Raynaud's disease and report one case. Their conclusions are as follows:

Raynaud's phenomena is usually bilateral, occasionally unilateral, but is rarely symmetrical.

It is more common in females between the ages of 28 and 35. When seen in children syphilis should be suspected.

Its relation to rheumatoid arthritis is well worthy of careful study, and that they may coexist there can be no doubt.

Treatment is of very great importance and special stress should be laid upon climate and occupation. The former should be very temperate and the latter should be a vocation not requiring much weight bearing. Cold bathing is contraindicated.

Proper shoes of the orthopedic type and woolen stockings should be worn at all times.

Internal medication may be used for improvement of the general health and not for the vasomotor conditions. No operative procedures should be performed. No plates should be worn. Cutting of any kind about the foot or toes should be discouraged.

The Calcaneo-fibular Ligament. Tracy[2] points out that practically all of the anatomists incorrectly or imperfectly describe and picture the calcaneo-fibular ligament. Its origin is *not* from the summit, apex or tip of the lower end of the fibula. It arises above this point on the anterior surface of the malleolus. Its direction is not fixed,

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(1) Am. Jour. Orth. Surg., May, 1909.
(2) Boston Med. and Surg. Jour., March 25, 1909.

as one would infer by reading the anatomists, but varies with the position of the foot. With the foot at right angles to the leg, its direction is downward and backward, but with the foot in the position of complete extension, the calcaneo-fibular ligament is directly backward, and the author has seen an anatomy teacher mistake it for the posterior fasciculus of the external lateral ligament, with the foot in this position. The German anatomist, His, has described its outer surface as forming a shallow furrow in which the peroneal tendons glide. This is true with the foot in the ordinary position midway between extension and flexion, but with the foot inverted, extended or strongly flexed, the calcaneo-fibular ligament is tensed and it become a straight cord without a furrow, lifting the peroneal tendons (brevis and longus) backward and outward from their usual course.

This is the result of a careful dissection of 28 adult feet, and his conclusions are:

The practical bearing of this investigation in regard to the correct surgical treatment of dislocation of the peroneal tendons is that the deepening of the groove in the fibula (taught in surgical textbooks by Cheyne and Burchard, Tillmans, Whitman and Monks) is unsound, because the groove of the fibula is not designed for the safe play of the tendons, is only a small part of the tendon trough; it is shallow normally, and we cannot improve on nature's normal forms.

On the other hand, the correct surgical treatment for dislocation of the peroneal tendons is the surgical reconstruction of the external annular ligament (as done and described by Kraske), and keeping the foot until healing takes place in such a position that the calcaneo-fibular ligament is relaxed. This position is that between extension and flexion.

INFANTILE PARALYSIS.

Truslow[1] urges the early splinting of paralyzed limbs to prevent the development of deformities and the structural shortening of the unparalyzed muscles.

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(1) Long Island Med. Jour., Sept., 1908.

In later cases, where deformity has developed, it must be entirely overcome before the development of physiologic function is possible.

In cases of completely balanced paralysis arthrodesis is recommended, followed by a plaster splint for three or four months, and after this by a steel splint or brace for a long period. In cases of unbalanced paralysis tendon transplantation is advised to weaken the stronger and strengthen the weaker side, and in some degree restore the muscle balance.

Even in very old and apparently hopeless cases developmental training is always well worth while.

In treating infantile paralysis, Vulpius[1] follows the practice of limiting the use of orthopedic apparatus as much as possible, using instead of these arthrodesis, tendon transplantation and neuroplasty. The most extensive use, however, which he makes of tendon transplantation is in severe cases, generally those requiring a number of operations such as myomectomies, tenotomies, osteotomies, tendon transplantations, redressments, etc., and requiring several sittings before the proper posture is obtained.

Vulpius gives the histories of 12 cases of the most extensive paralysis where a combination of operative interferences was necessary to enable the patient to walk.

Tendon Transplantation. After giving due credit to Nicoladoni as the inaugurator of this procedure, August Hildebrandt[2] in a recent article very painstakingly reviews the present state of the transplantation question. The total operation should be preferred to the partial, owing to the fact that in the latter method the branched off part of the muscle does not gain any independent action, but contracts with the main part of the muscle. Lange recommended the periosteal transplantation on account of his experience that the paralyzed tendons are fragile and the periosteum is much better to retain the silk sutures; then, too, the direction of the muscle can be modified by this method. Drilling a channel through the bone does not, however, seem to be necessary as the periosteal fixation of Lange proves absolutely sufficient.

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(1) Deutsche med. Woch., 53, 1908.
(2) Berliner Klin, Woch., No. 41, 1908,

Tendon transplantation having as its purpose the replacing of lost muscular functions is indicated only in cases of disturbed muscular equilibrium, i. e., deformities caused by such conditions. The best opportunities for transplantation are offered in cases of more or less limited paralysis with neighboring groups of muscles still in good condition. The majority of such cases are found in anterior poliomyelitis. It is essential to wait till there is no prospect for further spontaneous recovery of the paralyzed muscles, which as a rule is not less than six to nine months, while according to Bade spontaneous regeneration of the muscles may occur as late as two years after the attack.

In regard to the age, it should be kept in mind that the operation is the more difficult the younger the patient, and also that the after treatment depends in some measure on the mental development of the child. Most of the authorities therefore recommend the fourth year as the earliest limit.

The treatment of the spastic form of paralysis has been taken up much more recently than the flaccid. In this form it requires a good deal of experience to determine how much muscular power it will be advisable to add to a certain group of muscles in order to establish the muscular equilibrium.

Little's disease has also been recently treated by tendon transplantation. Here, however, this procedure has been largely abandoned in favor of more simple methods as the main feature of the disease is the contracture, the paralysis being of minor importance.

In cerebral paralysis where contractures are combined with paralysis a combination of transplantation with other methods of treatment might be advisable.

In contractures of inflammatory origin, also in pes valgus and rachitic flat-foot shortening of the overextended tendons or transplantation has been found of benefit.

It is needless to say that the plan of operation will be entirely individual. The author strongly recommends total transplantation. In order to secure independent action of the muscles, Lange's way of establishing a new point of insertion is justified in paralysis of great extent.

It is absolutely necessary to correct the deformity before the transplantation is begun as it is impossible to determine the length and tone of the muscles before.

As to the technic of the operation, the author calls attention to the fact that the paralyzed muscle often contains more healthy fibers in its upper part than in the lower; also that it is not wise to separate a portion from the middle where the nerves and arteries enter. A firm suture is of great importance. Care should be taken that the transplanted tendons have a direct course. It is of the greatest importance for the final result to give the transplanted muscle the right amount of tone. Tendon transplantation has been applied successfully in paralysis of the upper extremity. The difficulties here are much more considerable owing to the more subtle and delicate character of the movements.

In discussing the transplantation technic Ernst Mayer[1] emphasizes the importance of previous and after treatment. It is by no means sufficient to observe the most painstaking asepsis during the operation. A proper after treatment will also have to be followed out in order to obtain good functional results. The author refers to one of his complicated cases which illustrates his views in this matter.

Lodivilla[2] disproves most valiantly the main objections to tendon transplantation which are as follows:

1. That the transplanted muscle could not assume a function that is antagonistic to its normal function.
2. That the transplanted tendon becomes adherent to the surrounding parts by connective tissue adhesions, thus being hampered in its activity.

Moreover the author feels that the bad results of many operators are due either to a faulty plan of operation or to the lack of proper fixation of the tendons under suitable tension, the formation of adhesions being facilitated by a relaxed condition of the tendons.

MISCELLANEOUS.

Paralytic Calcaneus. Jones[3] has recommended a new operation for this most troublesome and intractable de-

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(1) Deutsche med. Woch., 53, 1908.
(2) Soc. med. Chir., Bologna, July 4, 1908.
(3) Liverpool Med. Chirurg. Jour., Jan., 1909,

formity. It is done in two stages, four weeks intervening, but should not be performed upon children less than eight years old.

Stage I. Divide the plantar fascia if contracted and wrench with hand or instrument.

Make incision down to bone about three inches in length on the inner side of the foot, the center of the incision being opposite the angle of convexity.

With periosteum elevator separate the soft structures from the tarsus above and below from the inner to the outer side.

Remove a transtarsal V-shaped section of bone. If there be valgoid deformity let the section be wider on the inner than on the outer side. Suture, and obliterate the cavus deformity by extending the foot, which is now bandaged to the tibia, the calcanean deformity being apparently much increased.

Stage II (four weeks later). Make a longitudinal incision at back of heel, the center being opposite the ankle-joint. Open the joint and take a wedge from the astragalus sufficiently large to be accurately obliterated when the foot is brought to right angles. Denude tibia and fibula of cartilage.

Volkmann's Ischemic Paralysis. Jones[1] opposes operative methods in the treatment of this condition, recommending the following:

Cut out of zinc or sheet iron five splints which will fit the patient's fingers when extended. An assistant is asked to flex the wrist fully, and to hold it forcibly and steadily in that position. It will then be noted that by this maneuver the fingers are relaxed, and each one must be separately splinted. The wrist is then released, and the patient is directed to systematically attempt to extend the now very contracted metacarpo-phalangeal range. After a few days this can usually be done sufficiently to admit a splint to be applied from the finger-tips to the wrist joint, the wrist being fully flexed to admit of this. The fingers are therefore bound in five splints, and over these the hand is fixed in a splint which reaches to the wrist. For several days the hand is exercised in the direction of extension,

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(1) Liverpool Med. Chirurg. Jour., Jan., 1909,

and a splint applied over the other splints extending from finger-tips to the elbow, and is at intervals altered so that by degrees the wrist is fully extended. For some weeks this position is maintained until all contractile elasticity is lost. The splints are then removed and the hand massaged.

The result of this treatment is very interesting. As soon as the hand is hyperextended and remains so without any tendency to relapse, the circulation will be found almost invariably to have improved, and in those cases where the nerves have escaped destruction the fingers will resume their normal appearance and use. In many cases where the nerves have lost their function during the contracture of parts, the extension of the hand is the starting-point of recovery. In every case improvement of tissue results.

The advantage of this method over the operative is that by manipulation every structure is stretched in the order of its tension. It allows of much more effective manipulation than where an open wound exists and it elongates structures which from their position it would not be safe to divide.

Ischemic Contracture. Hildebrand[1] points out the fact that ischemic contracture, while occurring very often under plaster-of-Paris casts, splints and so on, might occasionally be observed, where there is no dressing at all, moreover in cases of injury to the cubital artery. In one case the history of which is given in detail, a supracondyloid fracture existed and a splint was put on, which was followed by ischemic contracture. In another case no splint was applied at all and yet ischemic contracture was threatening due to compression of the cubital artery, which, however, was prevented in time by putting the joint in full extension.

Sciatica. Lange's injection treatment of sciatica has recently been tested by Peterson.[2] No untoward after-effects were noticed. Twenty-eight patients were cured; 12 considerably improved; 4 cases did not show any results. Of the 28 patients cured 9 had sciatic scoliosis with pain in

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(1) Zeitschr. f. Chir., Bd. 95,
(2) Diss, Kiel, 1908,

the back. In most of these cases the scoliosis disappeared promptly after the injection treatment was begun.

Torticollis. Kennedy[1] found nerve stretching unsuitable in the cervical region owing to the proximity of the nerves to their origin from the cord, while section of the nerve and immediate suture is a sure means to tear the nerve and muscle in the stages of degeneration and regeneration. The author suggests this method for cases which are only of a few months standing and which are so violent, that they cannot be restrained by medical means. In cases of long standing the operation is not advisable as the spasm in all probability would return.

Drop Phalangette. Stern[2] reports eleven cases. In fresh or early cases, over-extension of the phalanx in a suitable splint is all that is necessary for a complete union of the injured tendon and recovery of function. In old or resistant cases it is necessary to cut down on the injured part and securely anchor the tendon to the periosteum of the phalanx.

Rachitis. Blanchard,[3] in discussing bone fragility and eburnation of rachitis, sums up his observations as follows: Normal bone tissue ossifies slowly. Normal unossified bone bends under the pressure of the osteoclast. Rachitic bone may remain friable indefinitely, but with favoring conditions eburnates suddenly.

Eburnated bone breaks hard and is not amenable to any pressure of iron braces or plaster-of-Paris. Very mild bow-leg, that is not all or only slightly rachitic, may be autocorrected. Rachitic bow-leg, knock-knee or anterior bent tibia are never autocorrecting and frequently grow worse in bed.

Badly deformed rachitic knock-knee and bow-leg are occasionally seen in children that have never walked.

Rachitic bow-leg predisposes to rachitic coxa vara.

Rachitic knock-knee predisposes to rachitic coxa valga.

Knock-knee is a disturbed distortion of all of the long bones of the legs, having its usual inception in an outbend of the femoral shaft, though as the deformity pro-

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(1) British Med. Journal, Oct. 3, 1908.
(2) Am. Jour. Orth. Surg., Feb., 1909.
(3) Am. Jour. Orth. Surg., May, 1909.

gresses, the secondary outbend of the tibia frequently becomes the most pronounced. The skiagraphic observation of a large number of cases would seem to prove quite conclusively that these deformities closely follow fixed lines of development. Rapid osteoclasis is the safest and quickest means of correcting most of the rachitic deformities of the legs.

Steinmann[1] has used Beck's bismuth paste in 5 cases, the results, however, offering little encouragement. He asserts that these injections should be strictly avoided in all recent cases and in cases of high temperature and profuse discharge. The bismuth paste might be tried in cases of scanty secretion and long standing, but he thinks it doubtful if the method will work better than the other means of treating fistulæ.

Bismuth Injections. So far as bismuth poisoning is concerned, Stern[2] says, the bismuth of course must be absolutely pure, but even then a poisoning has been observed which seems to come from the metal itself and gives a blue line about the gums. But there is another danger, the salt of bismuth in common use has been bismuth subnitrate; it has been shown that when this salt is given internally in large doses, especially in the intestinal diseases of childhood, the drug may be decomposed into bismuthic sulphite and orthonitric acid (hypothetical H_3NO_4), which later becomes reduced in part to nitric and especially nitrous acids, the latter of which gives rise to the familiar nitrite poisoning. This can also be true of bismuth subnitrate when injected into fistulæ and genuine cases of nitrite poisoning have been reported from such injections. Stern has, therefore, substituted bismuth subcarbonate in his formulæ.

Tuberculin in Joint Tuberculosis. Ochsner[3] says: "If patients with joint tuberculosis come to the surgeon sufficiently early, if they are placed under proper hygienic conditions, if suitable measures are adopted for the prevention of secondary infection, if the joints are perfectly immobilized for a sufficient length of time, and if vaccine

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(1) Münch. med. Woch., 49, 1908.
(2) Cleveland Med. Journal, April, 1909.
(3) Illinois Med. Jour., Feb., 1909.

therapy is instituted under control of the opsonic index, I believe that the great majority of cases will secure perfect or nearly perfect functional and anatomic results. Many teachers have taught and are still teaching that long continued immobilization of an inflamed joint favors ankylosis. This teaching is theoretically untenable and contrary to clinical experience."

[The experience of the Editor is hardly in accord with the above. For more than two years we have used tuberculin both by Wright's method and by Trudeau's method, and while the majority of growing children do gain in weight, these children gained from two to eight pounds; it favors rather than hinders the development of abscesses; it hastens their spontaneous opening; it does not, however, hasten the healing of sinuses, and there is no evidence that it shortens the disease or prevents the destruction of bone. Unless it hinders bone destruction, checks abscess formation and hastens the healing of old and new sinuses there is no reason for believing that it has any influence upon the ultimate functional result to be obtained. That prolonged immobilization of tuberculous joints does not cause ankylosis is known to all orthopedic surgeons. That the lack of efficient immobilization leads to unnecessary joint destruction and consequent partial or complete ankylosis is also a well known fact. But only those few orthopedic surgeons with the largest experience may say when a joint no longer needs to be immobilized and may be permitted some motion to obtain the best functional result in the shortest possible time.—RIDLON.]

Koch's Tuberculin in the Treatment of Joint Tuberculosis. In discussing the subject Stern[1] says that he has during eighteen months treated thirty-seven cases with tuberculin by Trudeau's clinical method. Of these he reports five in detail. Of these five, four improved under treatment and one was worse. All of the cases had efficient orthopedic treatment, fresh air and over-feeding. His conclusions are as follows:

"Koch's tuberculin, although a terrible agent for harm when used indiscriminately in large doses, is a powerful agent for good when used in small doses either by the

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(1) Cleveland Med. Jour., March, 1909.

opsonic method of Wright or the clinical method of Trudeau.

"The laboratory method of Wright is still too complex, intricate and costly, to be able to diagnose, treat for from nine to eighteen months, and bring to a cure the general run of tuberculous cases which one sees in orthopedic practice. While not decrying its absolute value I would claim that the greatest good to the greatest number is obtained by following the clinical method of Trudeau in treating bone and joint tuberculosis.

"Notwithstanding the statements of the laboratory men to the contrary, *no harm* can come and a great deal of good can follow the proper use of tuberculin *without* the control of the opsonic index.

"No matter which method is followed, tuberculin must *not* be used *alone* for treatment but must invariably be a part of a rigid medical and surgical antituberculous regime.

"When so used it has proved in my hands an invaluable aid in the treatment. My cases have done better with it than they would have done without its use. They have responded quicker and have been discharged in less average time than ever before. Complications have either been avoided or when present have invariably (with one exception) subsided on its continued exhibition. This has been especially noticeable in my adult or older cases, in some of whom the gain in weight and strength has been truly remarkable.

"Tuberculin is not a cure-all, but so convinced am I of its efficacy and value that I will continue to employ it in the future in all cases of tuberculous bone and joint disease unless its use should be specially contraindicated."

[At the Home for Destitute Crippled Children in Chicago we tried out the tuberculin treatment by Wright's method through a period of over eighteen months, and abandoned it as not worth while. It was of no dependable value in diagnosis. A typical case of tuberculous hip disease of five years' duration, with three abscesses, gave to repeated tests a normal tuberculo-opsonic index. A case of knee joint disease proven to be tuberculosis by operation gave a normal tuberculo-opsonic index to repeated examinations. Cases of joint disease, clinically syphilitic, gave typical tuberculo-opsonic indexes. Tuberculous abscesses did not fade away, but on the contrary increased and went on to spontaneous opening with unexpected rapidity; and old sinuses were uninfluenced by the treatment. To be sure most of the patients gained in weight, but most of them were growing children, and we had no check on this increase of growth as the assistant having the work in charge neglected to weigh cases as instructed to do.

For somewhat more than six months we have been trying out the so-called clinical method of Trudeau, and have apparently followed the same method as that used by Dr. Stern, that is to say, we have used gradually increasing doses so long as the patients showed no clinical reaction, except when we have made a new purchase of tuberculin, in which case we have dropped back from the comparatively large doses to the original small ones. But despite this precaution in one instance ten of the eleven patients under treatment showed a profound reaction, in several cases amounting to a temperature of 104 to 105 degrees, and one of the children has not yet, after several weeks, got back to his previous condition of health. Our experience is conclusive that Stern is wrong in his emphatic statement that "no harm" can result from the use of tuberculin by the clinical method. We have given our patients, as Stern recommends, the best possible orthopedic and hygenic treatment before, during and after the tuberculin treatment. We have *hoped* to get results, but as yet we have had no results that warrant us giving anything like such enthusiastic approval of tuberculin as Stern has set down in his conclusion.—RIDLON.]

Iodoform Plug. In a number of cases of chronic osteomyelitis Auffret[1] has made use of Mosetig's iodoform plug. Considerating the excellent results obtainable by this method, it seems strange that it does not enjoy a more general recognition. Auffret considers as the most important point that all diseased tissue be removed thoroughly, leaving a cavity with a wide opening. The drying of the cavity must be done very thoroughly, but a tampon might accomplish this sufficiently if drying with hot air or thermocautery should not be practicable. The cases of osteo-

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(1) Gaz. des hôp., 1909.

myelitis are fit for the plug only after they have been suppurating for 3 to 4 months, as it is essential to remove all the tissue involved. If operation is performed too early, recurrence follows. Auffret points out especially that one ought not to expect too quick a healing of the wound, much less a primary union. There is always an attenuated suppuration of 1 to 3 months' duration, until finally the wound is closed. The appearance of iodoform on the dressing does not indicate the expulsion of the plug, but it means a progressive substitution for the plug by means of new formed bony tissue, as may be ascertained by x-ray pictures taken at regular intervals.

Technic. A paper read by Max Bohm[1] on Hessing's orthopedic technic covers pretty thoroughly the ground of Hessing's portative apparatus, stating five indications the contrivance might be wanted to comply with—exemption from weight-bearing, fixation, extension, redressment and substitution of paralyzed muscles. The author gives a concise description of the manufacturing of Hessing's apparatus and points out some of the mechanical principles. Besides its usefulness in fractures and chronic affections of joints muscular paralysis is a very broad field for it. Paralysis of the musculospiral nerve, pes calcaneus and deformities of all kinds should be considered as indications for Hessing's braces, made after plaster-of-Paris models. Ideal adaptation of the apparatus to the plaster-of-Paris positive is the secret of its efficiency. It might be mentioned that Hessing did not originally use a plaster model but made the model of wood in a very artistic way, adapting the apparatus to the wooden model.

Arthritis. A very rare and interesting affection is arthritis in psoriasis, described recently by Wollenberg[2] as arthropathia psoriatica. It complicates the psoriasis in about 2 to 5 per cent of the cases, giving preference to the male sex. The joints, preferably fingers and toes, are afflicted with painful swelling, with some rise of the temperature, resulting finally in contractures and formation of ankylosis. The pathologic changes seem to start from the top parts of the joint. In advanced stages, however,

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(1) Berliner klin. Woch., Nov. 30, 1908.
(2) Berliner klin. Woch., No. 2, 1909.

the bones become involved too, and by a process of atrophy and absorption, whole phalanges of fingers and toes might be missing. In the treatment, besides the internal medication, baths are of value. Mud baths are very valuable for the cure of the psoriasis as well as for the affections of the joints.

Bursitis. A. Reinhardt's[1] paper on primary sclerotic tuberculosis of the bursæ mucosæ is based upon his experience with six cases. These cases are noted for the slow development of a firm, fibrous tumor, located typically on places where there are mucous bursæ. They are round, triangular or irregular in shape. The connection with the underlying tissue, fascæ, aponeuroses and bursæ as a rule is a rather firm one, while the nodules can be enucleated easily out of the surrounding connective and fatty tissue and also show only slight connection with the skin. A predisposition to the disease is established by continuous irritation of the bursæ.

Bone Cysts. Based on his latest experience with two cases of bone cysts, Wollenberg[2] considers it advisable to wait for spontaneous cure if there is enough left of the cortical substance of the bone. On the other hand, if the disease progresses, the operation is indicated. In order to avoid spontaneous fractures Wollenberg advises the use of celluloid splints after the operation, to be worn until the *x*-ray examination shows enough of healthy bone. Spontaneous fracture is the most serious complication of the bone cysts and care should be taken to avoid it by all means available.

Osteitis Deformans. White[3] reports one case of this rare disease, with photographs and an *x*-ray picture, and quotes Paget's classical description as follows:

It begins in middle age or later, is very slow in progress, may continue for many years without influence on the general health, and may give no other trouble than those which are due to changes of shape, size and direction of the diseased bones. Even when the skull is hugely thick-

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(1) Zeitsch. f. Klin. Chir., Bd. 98, 1.
(2) Ther. Rundschau, 52, 1908.
(3) British Med. Journal, Dec. 5, 1908.

ened and all its bones exceedingly altered in structure the mind remains unaffected.

The disease affects most frequently the long bones of the lower extremities and the skull, and is usually symmetrical. The bones enlarge and soften, and those bearing weight yield and become unnaturally curved and misshapen. The spine, whether by yielding to the weight of the overgrown skull, or by changes in its own structures, may sink and seem to shorten with greatly increased dorsal and lumbar curves; the pelvis may become wide; the necks of the femora may become nearly horizontal, but the limbs, however misshapen, remain strong and fit to support the trunk. In its earlier periods, and sometimes throughout all its course, the disease is attended with pains in the affected bones, pains widely various in severity, and variously described as rheumatic, gouty, or neuralgic, not especially nocturnal or periodic. It is not attended with fever. No characteristic conditions of urine or feces have been found in it. It is not associated with syphilis or any other known constitutional disease, unless it be cancer.

Fractures. Lucas Championnère,[1] in discussing the treatment of fractures of the olecranon, points out that the recommendation of the suture in all cases, in analogy with the patella, is not justified. The olecranon has a greater vitality than the patella, interposition of soft parts, so embarrassing in the patellar fractures, is missing in the olecranon. The parting of the fragments is caused by the hematoma and the contraction of the triceps. If these keep on for some time, in spite of apparatus extension and immobilization pseudarthrosis follows. The best means to overcome the contraction of the triceps muscle is massage. After 2 or 3 days of massage the pain is gone and the separation of fragments is corrected. Broca distinguishes between fractures, in which only the tip of the olecranon is broken off, no diastasis of fragments being established, and in fractures of the middle of the olecranon in which a separation exists requiring suture.

Malleolar Fractures. In cases in which there is a considerable displacement it is wise to combine the reduction

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(1) Soc. de Chir., June, 1908.

with metallic structure. Anziolotti[1] reports 3 cases of his own experience. He performed the bloody union of the fragments by wire suture, thus preventing displacement and making the mechano-therapeutic treatment possible at a very early stage. Stiffness of the ankle-joint and atrophy of the musculature may be avoided. The method requires thorough antisepsis.

Wrist Levy[2] refers to the so-called Madelung's deformity of the wrist. This deformity, with an outset entirely spontaneous, gives the wrist a downward curvature with a dorsal prominence of the lower end of the ulna. The condition resembles somewhat subluxation of the hand. Madelung's deformity of the wrist appears in early childhood as the result of rickets. A connection with exostosis cartilaginea does not seem probable. The exostoses on typical places in Madelung's disease have to be looked upon as deformities from physical influences.

Humerus. Bossi[3] demonstrated by *x*-ray pictures cases of supracondyloid fracture of the humerus and showed the possibility of a complete adaptation if the elbow-joint is in extreme flexion, provided that the lower fragment is displaced backward. By permanent traction the apposition is accomplished. The author feels that this method is the only one which gives an ideal and complete adaptation of the fragments.

Humerus Varus. A condition analogous to coxa vara was found in cretius by Bircher.[4] There was a downward bend of the caput humeri, while the major tubercle was unusually prominent. The slight groove separating the head from the major tubercle is entirely missing. In advanced cases the head of the humerus may assume a mushroom shape disfiguration. The seat of the bend is the collum anatomicum humeri. Also the shaft takes part in the deformity as it even shows an outward rotation of the lower end.

Fibula. The congenital defect of the fibula has been studied very thoroughly by E. Krebser.[5] Concerning the

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(1) V. Ital. Orthop. Congress.
(2) Berliner klin. Woch., No. 50, 1909.
(3) Soc. Mil. de Med., June 30, 1908.
(4) Zeitsch. f. Chir., Bd. 96, 4 to 6.
(5) Zeitsch. orth. Chir., xxiii., 1909.

clinical feature of this condition the author calls attention to the considerable shortening of the leg combined with anterior or outward bend of the tibia. In treating this deformity the author advocates the application of a prothesis as soon as practicable. Tenotomies often become necessary owing to the increased tension of the tendo Achillis. Osteoplastic substitution for the bony defect has been practiced by Bardenheuer, who has planted the astragalus in a longitudinal split of the tibia. He was followed in this method by Nasse, but since no final results of this are known as yet, no opinion can be ventured, nor do we know whether the splitting of the epiphyseal line has any bad effect upon the further growth of the bone. Franke practices a very ingenious method, consisting in uniting the tibia with the posterior part of the calcaneus; but it seems not advisable to undertake this operation before the sixteenth or eighteenth year, as the good result might be endangered by the increasing shortening of the leg.

Schlatter,s Disease. Bowse and Thomson[1] describe cases of this rather unusual condition. It consists of a partial separation of the tibial tuberosity before ossification is complete between the upper epiphysis and the shaft. That part of the shin bone called the tibial tuberosity sometimes develops from a separate center of ossification and sometimes as a tongue extending downward from the superior ephiphysis of the bone. It is in this latter class that a partial separation of the bone by a more or less violent athletic effort is likely to take place. The treatment, as in that analogous condition known as traumatic coxa vara, consists in mechanical protection and restricted exercises for a longer or shorter period.

Myositis Ossificans. Painter and Clark[2] have gone very fully into a description of this, fortunately, rare disease. It is not possible to do justice to their paper as to the etiology, pathology, clinical course, differential diagnosis and prognosis. But as to treatment we may quote them entire.

The attempt to modify in any material manner the

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(1) Edinburg Med. Jour., March, 1909.
(2) Am. Jour. Orthop. Surg., May, 1909.

progress of these cases has been, up to the present time, unavailing. A few remarkable cures have been reported, but in view of the inefficiency of the same measures in other cases and the uniform failure to permanently arrest the progress of the disease, the conclusion in regard to these few exceptions to the general rule is forced upon us that the disease in question was not a true myositis ossificans. A great many drugs have been tried, most of them of such a nature as to be, theoretically at least, solvents of calcifications. Some of the later of these, like thiosinnamin and hyoscinamin, are thought to be absorbents of connective tissue growths. Among the acids which have been administered locally by direct injection or internally are acetic, hydrochloric, lactic, picric and sulphuric. Some of the animal extracts from the ductless glands have been used, notably thyroid preparations. The iodid of potash has been thoroughly tried many times. The results of these therapeutic measures have been failure in practically every case of progressive myositis ossificans where the diagnosis has been well established.

Operative measures upon this type are equally futile. In fact, in the case reported in this paper the recurrence of the lesions was quite as rapid, if not more so, than had been the development of the original calcifications.

Airner[1] reports on cases of traumatic myositis ossificans cured by fibrolysin injections. Thirty-four injections were made in 40 days in a case showing bony formation in the musculature of the quadriceps. After 5 weeks a remarkable improvement was noticed, permitting nearly normal action of the muscle. The fibrolysin treatment is a very effective method in beginning and still progressive cases. Systematic examination by *x*-rays will show the disappearance of bony tissue.

Tuberculosis. Calot[2] in a recent article gives his method for the treatment of *tumor albus*. He is a follower of the injection treatment, using two kinds of mixtures:

1. Iodoform-creosote-oil: Oil, 75.0; ether, 25; creosote, 4.0; iodoform, 10.0.
2. Camphor-naphthol-glycerin: Glycerin, 10.0; cam-

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(1) Münch. med. Woch., 15, 1909.
(2) Gaz. des Hôp., 1909.

phor naphthol, 2.0. The latter solution should always be made fresh and injected immediately.

After putting on a cast reaching over the two adjacent joints, in cases with accumulation of fluid the injection treatment is begun, using the first solution in mature cases and in cases only partly liquefied the second, the dose being 3 to 10 gm. The injection in pure pus cases is repeated about 10 times, in cases of hydrarthrosis 5 to 6 times at intervals of 5 to 6 days. Then the abscess is emptied again by puncture without an injection following and a systematic compressory dressing through the window in the cast is added, to be continued for 2 to 3 months. Then the cast is removed and the patient permitted to walk after a celluloid or leather splint is put on. This should be worn for at least 4 months. In dry or fungoid forms of joint tuberculosis Calot uses different methods according to whether a benign and recent form or a case of more than 6 months' standing is in question. In the first case the iodoform-creosote-oil is used 10 times, in the other naphthol-glycerin. The injection is performed in daily succession until liquefaction occurs, which as a rule is on the fifth or sixth day. The punctures and iodoform injections are performed every fourth day.

Retroperitoneal Tuberculous Glands. Painter[1] says: The relation of extraspinal abdominal lesions to the production of symptoms referred to the vertebral column is a matter which demands more attention than is commonly given it. The close approximation of the abdominal viscera to the anterior surface of the spinal column makes it possible to incite symptoms both objective and subjective which might easily lead one astray, not only as to the location of the lesions in question, but as to their actual character. Any pathologic enlargement of the organs contained within the abdominal cavity may readily, through mere pressure (e. g., aneurism) cause a list of the trunk and more or less restriction in the motions of the spine. This is especially true when the cause for such pathologic enlargement is of an inflammatory character, resulting in the deposit in the tissues about the anterior surface of the

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(1) Southern Med. Journal, Jan., 1909.

vertebral column of an inflammatory exudate. Such exudates operate in two ways—they, in some cases, extend directly to the osseous structure of the column and erode it, or they irritate the muscles which have their origin or insertion upon the column and establish a condition of spasm in those muscles which is evidenced by pain, impairment of function and oftentimes by deformity. Perinephritic and nephritic abscesses and aneurisms, e. g., are capable of doing this long before the existence of lesions of the kidney or blood vessels are even suspected. Inflammatory conditions about the colon and appendix give rise to such distinctively characteristic signs that it is only rarely that the clinical symptoms are spinal, and when they are sufficiently acute to be unmistakable the patient is rarely examined to see if there are signs suggesting spinal complications. Acute infectious processes in bone, as e. g., osteomyelitis and even subacute infections may cause decidedly significant spinal symptoms.

The earliest symptom is usually pain and stiffness. Great difficulty is experienced in assuming an erect position and in rising from a low chair or a bed after prolonged confinement to either. The advent of these symptoms is not generally rapid, but slow and gradually augmented. There is frequently a slight amount of deformity noted early, as e. g., a list to one side or a psoas contracture, causing limp. In other cases when pain is not a conspicuous feature the patient complains of stiffness in the spine and may note a swelling in the thigh or lower abdomen. Indeed, swelling may be the earliest suggestion of the existence of something wrong, and search for the origin of the enlargement brings into notice the existence of lesions more or less remote. As a rule the swellings which occur in the lower quadrants of the abdomen and penetrate occasionally beneath Poupart's ligament, are not inside the sheath of the psoas muscles and, therefore, do not commonly give rise to the symptom of contraction and consequent flexion of the thigh. When the spine is examined the lumbar region is usually found to be held rigid to a greater or lesser extent. Rarely there is a slight anteroposterior curve, which may be dignified by the name of a kyphos in some cases, but which is not always a permanent deformity though it may have a strong resemblance to a destructive osseous lesion. A significant clinical peculiarity of these pseudo kyphoses is that though two or three spinous processes may take part in the development of the deformity, yet in view of the rapid development of symptoms it is not sufficiently angular to be indicative of a central, vertebral lesion, and is, therefore, probably due to spasm of the spinal muscles. Obliteration of the lumbar lordosis is practically always present. Rigidity of the vertebræ does not commonly extend above the eighth or ninth dorsal and generally not quite so far. Flexion of the trunk is more readily performed than lateral motions or hyperextension. Voluntary attempts to make these motions are not usually very painful. Abdominal palpation may reveal much or little.

Differential Diagnosis.—Enlarged tuberculous glands must be differentiated from aneurisms, gummata, actinomycosis, sarcoma and carcinoma, the infectious and hypertrophic types of arthritis, perinephritic and nephritic abscesses, appendicitis and osteomyelitis. From aneurism the age of the patient as well as the physical signs of arterial degeneration and the specific indications of an aneurism must be searched for. A history of syphilis would make it necessary to try the therapeutic test in order to eliminate the possibility of such an infection. Actinomycosis is rarely a cause for interabdominal glandular enlargement. Examinations of the pus or the existence of other actinomycotic lesions might clear up the diagnosis. Malignant disease of the abdomen is rare in individuals at the age of patients who most frequently suffer from mesenteric glandular enlargements. Primary sarcoma of the spine is more common in young people than is carcinoma. Primary carcinoma of the spine is practically unknown. Vertebral osteomyelitis has all the clinical characteristics of acute osteomyelitis elsewhere and should be capable of differentiation without difficulty. Infectious and hypertrophic arthritis usually more completely stiffen the column and the latter at least is characterized by a certain amount of motion in some directions. There are commonly other parts of the body affected in a similar manner in these conditions.

Treatment.—The management of these cases is largely dependent upon good hygiene, wholesome diet and surgical rest. Inunctions and various internal medications have been tried without avail. Operative measures except when directed to the aspiration of abscesses is rarely indicated. A few successful cases of removal of these glands have been reported. Fixation of the spine is helpful in controlling pain and possibly in preventing extension from the glands to the vertebral column.

Non.Tuberculous Joint Diseases. Goldthwait[1] calls attention to this very large and important class of joint diseases that we have been accustomed to call rheumatoid. The gonococcus, pneumococcus, streptococcus, the typhoid bacillus, the influenza bacillus and many others, now known or to be discovered later, under certain conditions apparently result in joint inflammation, the special pathologic lesion in the individual joint depending upon the special organism, the virulence of the organism or the degree of the individual's resistance. The pneumococcus in its virulent form is so characteristic in its effect that it can often be recognized before any bacteriologic test is made. The same is true of the gonococcus and typhoid bacillus, and with our increasing knowledge the same clinical recognition will probably be possible with many of the other organisms.

Recognizing infection as the cause of these conditions, naturally the obvious principle in the treatment consists first in finding and treating the source of the infection, and it is in this part of the study and treatment of these conditions that very marked advance has been made. Comparatively few of the cases are primarily joint cases, the special joint symptoms being almost always the sequel of some disease condition present elsewhere in the body, exactly the same as the diseases of the ear so often follow "la grippe" or various throat lesions. The primary disease may have been insignificant in comparison to the sequelæ, but this is, of course, no more the case with joint diseases than with other better understood pathologic processes. Simple colds, tonsilitis, ulceration of the teeth,

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(1) St. Paul Medical Journal, Sept., 1908.

intestinal disturbances, all may lead to joint disease, and not only is this so, but wherever the joint process remains active it usually means that some source of active infection is still present within the body. This being the case, it becomes our duty in the treatment of such conditions to hunt out the point of infection with the idea of its removal rather than to smother the symptoms with drugs while the primary disease is all the time going on actively. The chronic rheumatism with repeated exacerbations of the acute symptoms usually means just this, and such a case should always be studied with reference to finding the source of the infection.

The first thing necessary is a thorough examination. The throat, the gastrointestinal tract, the teeth, the genito-urinary tract, should all be examined, as well as cutaneous disturbances from which absorption might result. In the throat, the tonsils are as a rule only moderately enlarged, but in them are apt to be certain crypts distended with pus and detritus. If such a source of infection is present, in a case such as is being discussed, it is obviously approaching the subject from the wrong end to treat the joints until the source of infection has been removed. With the tonsils the accessory sinuses and passages about the throat and nose should always be examined, as in them not infrequently is the trouble found.

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